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From generative fit to generative capacity: exploring an emerging dimension of information systems fit and task performance

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FROM GENERATIVE FIT TO GENERATIVE CAPACITY: EXPLORING AN EMERGING DIMENSION OF INFORMATION SYSTEMS FIT AND TASK PERFORMANCE

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Abstract

Information systems research has been concerned with improving task-related performance. The concept of fit is often used to explain how system design results in better performance and overall value. So far, the literature focuses mainly on performance evaluation criteria that are based on measures of task efficiency, accuracy, or productivity. However, nowadays, productivity gain is no longer the single evaluation criterion. In many instances, computer systems are expected to enhance our creativity, reveal opportunities and open new vistas of uncharted frontiers.

To address this void, we introduce the concept of generativity and develop two corresponding design considerations--"generative capacity" that refers to one's creativity, ingenuity and mental dexterity, and "generative fit" that refers to the extent to which an IT artifact is conducive to evoking and enhancing that generative capacity.

We offer an extended view of the concept of fit and realign the prevailing approaches to human-computer interaction design with current leading-edge applications and users' expectations. Our findings guide systems designers who aim to enhance creative work, unstructured syntheses, serendipitous discoveries, and any other form of computer-aided tasks that involve unexplored outcomes, expect fresh configurations or aim to enhance our ability to boldly go where no one has gone before.

In this paper, we explore the notion of generativity, review its theoretical background in the context of the social sciences, and argue that it should be included in the evaluation of task-related performance. Then, we briefly explore the role of fit in IS research, position "generative fit" in that context, explain its role and impact on performance, and provide key design considerations that enhance generative fit. Finally, we demonstrate our thesis with an illustrative case of good generative fit, and conclude with ideas for further research and final thoughts.

Keywords: Fit, Generativity, Boundary-Spanning Design, Computer-Aided Design, Human-Computer Interaction, Generative Fit, Generative Capacity

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1 INTRODUCTION

In this theory development paper, we offer an extended view of the concept of fit in an attempt to realign the prevailing approaches to human-computer interaction design with current leading edge applications and users' expectations. Specifically, we identify an emerging dimension of task performance relating to creativity and innovativeness and explore how information systems can be fitted to enhance this dimension.

It has been argued that fitting the human-computer interface, and more generally, fitting computing services, to a user and an underlying computer-aided task enhances the desired outcome and has a positive effect on overall performance (Vessey & Galletta 1991, Baecker et al. 1995, Goodhue & Thompson 1995, Zigurs & Buckland 1998). Although one's performance is theorized in a generalized fashion as related to any kind of a priori objectives associated with an underlying task (Daft 1991), the literature so far focuses mainly on performance evaluation criteria that are based on measures of task efficiency, accuracy, or productivity (Zhang & Na 2004).

This view of performance was sufficient in the early days of personal computing when computers were seen mainly as productivity tools and the emphasis was on productivity and efficiency of operation. However, nowadays, productivity gain is no longer the single evaluation criterion. In many instances, computer systems are expected to be intelligent, communicative and stimulating in order to enhance our creativity, reveal opportunities and open new vistas of uncharted frontiers (Shneiderman 2002).

To address this void in information systems research, we introduce the concept of *generativity* and develop two corresponding design considerations--*generative capacity* and *generative fit*. In bold, broad strokes, *generative capacity* refers to one's creativity, ingenuity and mental dexterity, and *generative fit* refers to the extent to which a particular IT artifact, or part thereof, is conducive to evoking and enhancing that generative capacity. We submit that a thorough study of the two interrelated concepts and subsequent operationalizations can guide systems designers who aim to enhance creative work, unstructured syntheses, serendipitous discoveries, and any other form of computer-aided tasks that involve unexplored outcomes, or who expect fresh configurations, or aim at boundary spanning results. The concept of generative fit extends the current understanding of fit-performance relationship in the context of IS research and helps to update our body of knowledge with the requirements of contemporary computing.

In the next section, we explore the notion of generativity, review its theoretical background in the context of the social sciences, and provide a working definition of generative capacity. Then, in the subsequent section, we briefly explore the role of fit in IS research, position "generative fit" in that context, explain its role and impact on performance, and provide key design considerations that enhance generative fit. Moving on, we demonstrate our thesis with an illustrative case of good generative fit, and conclude with ideas for further research and final thoughts.

2 THE CONCEPT OF GENERATIVITY

Generativity refers to a capacity of producing or creating something. In natural language, to generate is to bring into existence. According to Webster Dictionary, to *generate* means to produce something concrete (e.g., to generate electricity), to originate abstract concepts (e.g., to generate ideas), to be a source or cause inspiration (e.g., to generate enthusiasm), or to reproduce (e.g., to give birth to a new generation). Generativity emphasizes a creative capacity that focuses on creating something that is beneficial and desirable. We look at several instances of generativity in the social sciences and then develop its application to information systems.

The concept of generativity has been applied time and again in the context of the social sciences. Erikson (1950) examined *psychosocial generativity* as a psychological concern and a vital aspect of adulthood. The psychosocial stream treats generativity not as mechanical reproduction but rather as regeneration. Psychosocial generativity is a human need for continuity and rejuvenation through the next and hopefully further refined generation.

Chomsky (1972) introduced generativity to linguistics with *generative grammar* that refers to the deep structure of language underlying the richness of any natural language and its infinite expressive capacity. Just as the building blocks of DNA can produce infinite configurations of life forms, for linguists, the deep structure of a language can generate infinite syntactical configurations. Generative grammar implies infinite and ever-growing possibilities.

Schön (1979) discussed the role of *generative metaphor* as a mechanism in which one changes perspectives on the world and gains new insight. In a similar fashion, Morgan (1986) with *Images of Organization* applied the principles of generative metaphor to the study of organization and organizational forms. The metaphors we use are fateful. Through our presuppositions and metaphoric language we largely create the world we later discover. Generative metaphors have a transformative power because they shape the images we envision, and in turn, the images of the future guide our present actions. A generative metaphor has the power to reconstruct our social reality and consequent action.

Gergen (1994) introduced *generative capacity* as a radical boundary-spanning driving force that can provoke and transform social reality and social action. Generative capacity, he argues, is "the capacity to challenge the guiding assumptions...to raise fundamental questions...to foster reconsideration of that which is taken for granted, and thereby to generate fresh alternatives for social action." Generative capacity refers to the ability to challenge the status quo, to think out-of-the-box, and to imagine the unimaginable.

Zandee (2004) proposed *generative inquiry* as a transformative process that offers an alternative to the rationally-structured theory development that is commonly used in social studies. Generative inquiry is a recurring hermeneutic process in which we reflect on experiences, and in turn, experience the effect of that reflection. This cyclical and self-perpetuated process gravitates between reflection and experience, thereby shifting our attention from the socially constructed logical rationalism into a space grounded in visceral experiences and a paradigmatically-loose reflection. This, in turn, can help us to overcome the gravity of the dominating paradigmatic thinking, which eases the way for the emergence of theoretical quantum leaps. Generative inquiry offers a revitalization process of our epistemic stance that can redefine our personal, professional, collective and social existence.

The above review reveals a multitude of closely related conceptualizations of generativity in the social sciences. In sum, *generativity* refers to a capacity for rejuvenation, a capacity to produce infinite possibilities, a capacity to reconstruct social reality and consequent action, a capacity to challenge the status quo and think out-of-the-box, and a capacity to revitalize our epistemic stance.

Clearly, generativity is associated with the notion of creativity. The mainstream treats creativity as a desirable novel act of an individual (e.g., Newell, Simon & Show 1962). Others treat creativity as a socially constructed act that does not happen in isolation in people's minds; or as Csikszentmihalyi (1996) put it, creativity is an "interaction between a person's thoughts and a sociocultural context"-- it is "a process by which a symbolic domain in the culture is changed."

Based on a review of over 100 published definitions of creativity, Couger (1996) concludes that creativity is comprised of two main factors: "newness or uniqueness" and "value or utility." However, whereas creativity implies something new and useful--generativity connotes with renewal, continuity and growth. Something creative is not only unique; part of being creative is to be unique and different, thereby it also implies being discrete and isolated from other instances. In contrast, something generative is new but not in a sense of being different. It is new in the sense of being an expansion and pushing the boundaries for sake of revitalizing the mature, refreshing the stale, and renewing the outdated.

In the context of this study we explore the concept of generativity, or more particularly, the notion of generative capacity. **We define <u>generative capacity</u> as the ability to rejuvenate, to produce new configurations and possibilities, to reframe the way we see and understand the world, to think out-of-the-box and to challenge the normative status quo.** Next, we relate generative capacity to information systems and develop the concept of generative fit.

3 GENERATIVE FIT IN THE CONTEXT OF INFORMATION SYSTEMS

This link between fit and performance is explored below by looking at three types of fit: physical, cognitive and affective. Given an understanding of the three types of fit and their interdependence, we add a fourth type of fit, namely generative fit, which is the focus of this paper.

3.1 Fit in Information Systems Research

The concept of fit plays a central role in the study of the relationships between people and information systems, mostly by the special interest group of Human-Computer Interaction (HCI) research. Differences aside, the ubiquitously held concept of fit maintains that fitting the human-computer interface to the attributes of a user and an underlying task at hand enhances performance. Whereas user and task characteristics are commonly treated as exogenous, HCI research focuses on investigating that fit, its relationship to attributes of information technology, and how fine-tuning fit can enhance task performance. Thus, the effect of fit on performance is the fundamental cause-effect relationship under investigation.

So far, fit has been conceptualized as physical fit, cognitive fit and recently affective fit too (Te'eni 2005). Physical fit, such as ergonomic fit and other related design elements, allows for comfortable operation and ensures minimal physical effort to accomplish a task and consideration for the user's overall well-being (Buxton 1986).

In the same fashion, cognitive fit minimizes the cognitive effort needed to transform representations and subsequently to perform a task. Cognitive fit seeks to match the information representation displayed, to the user's mental model of the task demands. Assuming that users are guided by their particular mental model, it is theorized that a consistency between these mental models and the computer representation of task-related information reduces the propensity for error and reduces the effort and time required to complete the task (Vessey & Galletta 1991). Parallel research efforts, which do not use explicitly the term cognitive fit, have also shown that incongruence between task demands and display hinders performance (e.g., Jarvenpaa 1989).

Affective fit can be conceptualized as interface design considerations that promote user's positive affect, or in a more generalized form, fit with a user's desired affective state. Whereas affective fit per se is still an unexplored territory, recent work emphasizes the role of emotions in computing (Norman 2004) and the importance of positive affect as an integral part of HCI research and teaching (Picard & Klein 2002). Affective fit, or a similar conceptualization thereof, is a design requirement in people-oriented systems design methodologies such as participative design (Ehn 1989), value sensitive design (Friedman et al 2006) and the like.

3.2 Generative Fit

So far, task performance, the outcome of good fit, has been conceptualized and operationalized in the literature mainly with task-related efficiency-based criteria (e.g., measures of task efficiency, accuracy, or productivity). Other kinds of performance criteria such as user's overall well-being, minimizing health hazards, or enhancing positive affect have been examined, but the lion's share of the relevant research focuses on task-related efficiency-based criteria. In this study, we too concentrate on task-related performance and argue that the prevailing efficiency-based criteria alone do not provide sufficient understanding of the design requirements in today's wide array of information systems.

We focus on task-related performance and submit that it has two unique components. One component of performance is *operational efficiency*, and the other is *generative capacity* (see Table 1). Operational efficiency is the kind of task performance that is usually observed in the literature. It relates to tasks with low ambiguity, finite in nature, well-articulated and in which one is expected to be efficient, accurate and on time. Generative capacity, however, relates to one's ability to deal with a task with high ambiguity, open-ended in nature, unclear in a considerable part and in which one is expected to be innovative, expansive and to make a difference.

Dimension	**Operational Efficiency**	**Generative Capacity**
Cognitive Process	Convergent	Divergent
Nature of Task	Low ambiguity	High ambiguity
Boundary of Task	Restricted	Open-ended
Nature of Outcome	Known in advance	Unknown, at least in part
Desired Action/ Process	Follow procedure	Be creative, innovate
Success Criterion	Efficiency, accuracy, on-time	Making a difference, rejuvenating

Table 1. Juxtaposing Two Task-related Performance Types

Whereas for some tasks operational efficiency is critical and generative capacity is counterproductive (e.g., tasks related to manufacturing control systems), for other tasks operational efficiency is not relevant and generative capacity is critical (e.g., tasks related to scenario planning). These are two extreme instances. The first instance represents a fundamental need of *convergent action* that requires users to be concrete, accurate, effective, and fast and with little or no deviation from standard operating procedures. The other instance represents a fundamental case of *divergent action* that requires users to be imaginative, creative, innovative, and provocative and with little or no conformism (see Figure 1).

The extent of each component, i.e., the extent of desired *operational efficiency* and *generative capacity*, may differ according to the characteristics of the underlying task. In extreme instances, only one component is desirable and the other is not relevant and maybe even counterproductive (Arrow 1 and Arrow 5 in Fig 1). However, in most cases, the underlying task requires a blend of both operational efficiency and generative capacity, as described in Figure 1. Whereas Arrow 1 and Arrow 5 in Figure 1 represent the two extremes, Arrow 3 represents a unique case in which both operational efficiency and generative capacity are critical for performance (e.g., tasks related to computer assisted design of a building as described by the illustrative case in the following section). In the same fashion, Arrow 2 represents a case in which the blend should emphasize generative capacity (e.g., tasks related to DSS/ESS systems), and respectively, Arrow 4 represents a case in which the blend should emphasize operational efficiency (e.g., tasks related to keyword search such as in the case of products search in online shopping or references search in research database). The main concern here is fine-tuning the blend of operational efficiency and generative capacity for the particular task characteristics. Complex systems or systems with many variants such as knowledge management systems or data mining systems should be assessed for the right blend on a case by case basis.

We already specified the effect of fit on performance and discussed how the current three conceptualizations of fit (i.e., physical, cognitive and affective) are aligned with the two conceptualizations of performance (operational efficiency and positive affect). We also defined generative capacity and explored its role in a desired outcome vis-à-vis operational efficiency. The final building block that requires further elaboration is the kind of fit that enhances generative capacity.

For simplicity and consistency's sake, **we define *generative fit* as the interface and system design considerations that have a positive effect on generative capacity. Therefore, *generative fit* produces or assists users in the production of new configurations and possibilities, fresh and innovative ideas, and out-of-the-box thinking that challenges the normative status quo.** Unlike the former treatment of fit, generative fit is inherently dynamic and enhances human processes. Moreover, it primarily enhances human strengths and capabilities rather than compensating for their limitations.

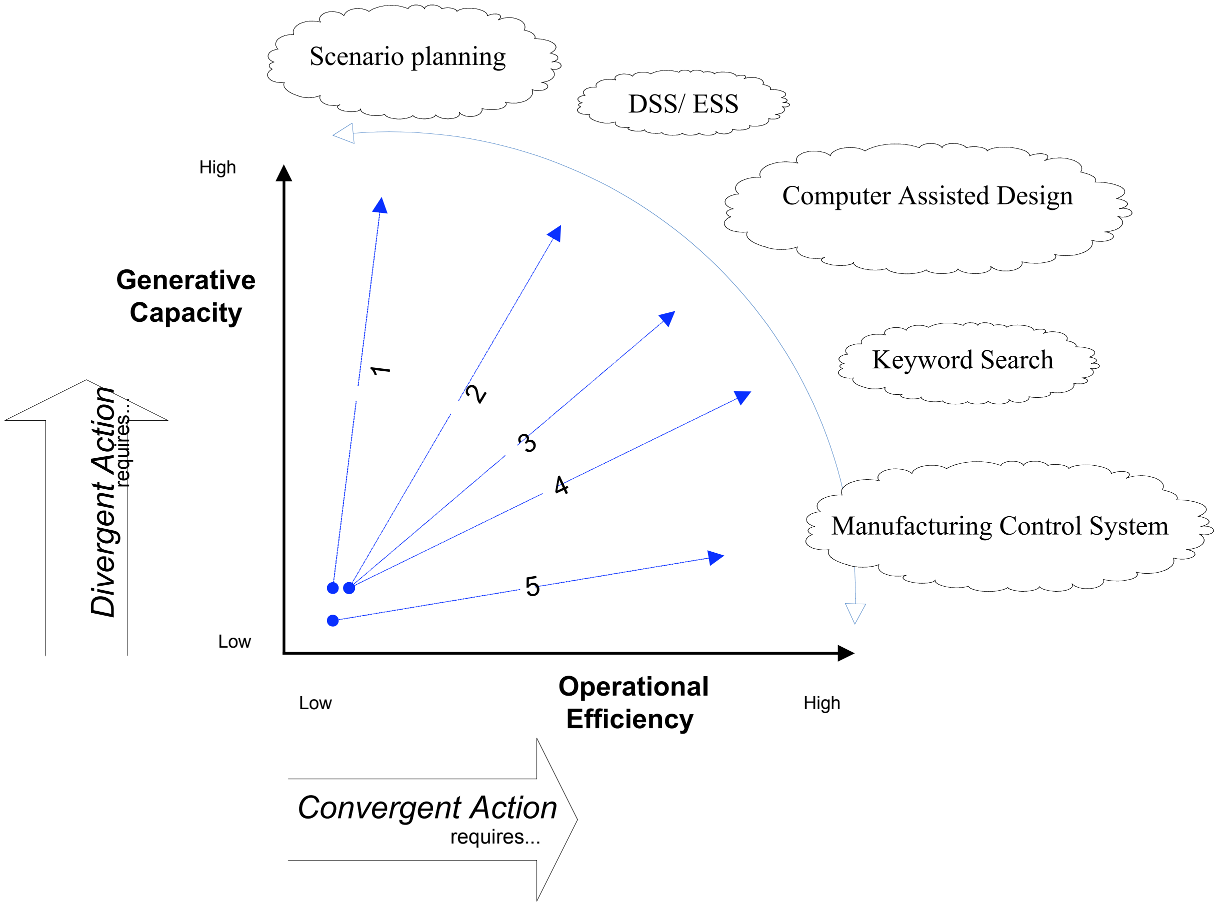

Figure 1. *Balancing between the Need for Operational Efficiency and Generative Capacity Based on Task Characteristics.*

3.3 Generative Design

The reminder of this section provides key design considerations that enhance generative fit. Most of the literature that discusses the conditions conducive for innovative processes emphasizes features of work environment that promote one's creativity. For example, motivation, autonomy, work settings, climate, work load, and personal characteristics (Amabile et al 1996, Stenmark 2005). There is not much attention to the possible impact of information technology in that context.

Building on studies of the effect of knowledge sharing in communities of practice, the impact of information technology on socio-technical systems, and current experience with building technology-intensive computer-based innovative design environments (Brandon 2004), we offer the following benchmark factors and broad design directives that contribute to generative fit:

Integration

Supporting integrated platforms using distributed object systems that provide real-time on-the-fly information and flexible interoperability between heterogeneous systems. Bolstering social integration through designs that promote system-wide boundary-crossing, across-the-board sharing, and cross-fertilization.

Communication

Providing ubiquitous access and fast connectivity to knowledge based systems. Supporting participative action, ad-hoc and ongoing cooperation, and collaborative work practices.

Intelligence

Designing adaptive systems that incorporate continuous learning and continuous improvement based on user feedback and other performance measures.

Visualization

Incorporating human-centered visualization tools that provide integrative views, scaling, zoom in and out, and easy movement in the task space.

Rejuvenation

Supporting iterative processes and generating an infinite number of configurations. Building an integrative path for innovation.

These top-level design principles promote generative fit. However, generative fit alone, without the right configuration of the human factor and the proper systemic support, is insufficient to promote generative capacity. It still requires a system-wide multidisciplinary approach, across the board support of all parties, and the development of shared standards and work practices.

4 AN ILLUSTRATIVE CASE OF GENERATIVE FIT

The unparalleled successful adoption of IT-enabled 3D digital representation in the office of architect Frank O. Gehry is a good illustration that demonstrates the concept of generative capacity and its determinant generative fit. The case is based on interviews (with various internal and external stakeholders) that were conducted in the course of a study about networks of innovation in architectural design and construction firms. An elaborated description of the study is available in Boland, Lyytinen, & Yoo (2003). We sought to illustrate our theoretical conceptualization of generativity using their account. In this paper, we only highlight key points from the case aiming to make a concrete illustration of our thesis and not to provide a rich account as a verification and evidence. Considering the exploratory nature of the study and its aim to reveal merely initial evidence, a single case study can be sufficient in this instance (Yin 1994).

The case study is based on 66 interviews that aimed to reveal how the various actors related to Gehry Partners experienced the newly implemented digital 3-D representation; how it affected their information sharing practices; how they adapted to the changes that resulted; how it made a difference in their work practices; and how their associates and affiliates (e.g., contractors, regulators, clients) adopted and appropriated the new digital 3-D representations.

In comparison to the traditional 2-D blueprint drawings, the widely used 2-D computer drawing applications such as AutoCAD contribute to enhanced operational efficiency through improved drafting productivity, decreased errors, reduced communication cost, and employment of deskilled workforce. The productivity gain of these applications is attributed mainly to its ability to reuse design objects. With 2-D computer drawing applications, architects tend to recycle design objects from a previous project in order to save time. These applications are also limited in their capacity to handle complex objects. Consequently, in large scale buildings, architects using 2-D CAD systems tend to use simple design elements that repeat in a monotonic fashion, as illustrated in Fig 2. Therefore, the more they rely on 2-D computer drawing applications, the less they create original design content in a given project (Mitchell 2004). Thus, whereas 2-D computer drawing applications are designed with efficiency-based criteria in mind and are geared toward convergent action, they also inhibit generative capacity.

The utilization of software packages such as CATIA and Rhino for digital 3-D representation in the architecture, engineering and construction (AEC) industries constitutes a dramatic departure from the frequently used 2-D computer drawing applications. In contrast to drawings, the 3-D CAD applications allow full visualization of the building designs in any scale and any level of details. Architects can move quickly back and forth between images of the entire building from different perspectives, its sub sections, and particular details of electrical, mechanical, and other design elements. This added flexibility allows for quick simulations and frequent iterative changes at very little time which was not possible with 2-D CAD applications. In this case, we identify both high operational efficiency and high generative capacity. The latter is largely achieved by the high generative fit that stems from tight integration, superb visualization, and rejuvenation power. The combined operational efficiency and high generative capacity allows for large scale projects with complex design, as illustrated in Fig 3.

The 3-D CAD is based on an Integrated Virtual Prototyping which means that everyone works on the same model and the same set of plans, as opposed to the old way in which each contractor or stakeholder would have only their own custom-designed subset. Having to work together with the integrated virtual prototyping stimulates cross-fertilization and exchange of ideas that turns into a more creative, more innovative, and more efficient design.

Furthermore, in the 2-D CAD, the measurement of each construction object is done relative to other nearby objects within a grid of points that is pre-specified by the architect and marked on site by a surveyor. However, with 3-D CAD representations the measurement of each construction element is specified by the Euclidean coordinates <x,y,z> of its spatial location relative to one absolute point. Moving from a relative to absolute measurement model reduces significantly the possibility of propagating measurement errors, thereby increasing the project's operational efficiency.

Finally, the complex design elements and continuous change at all fronts motivate constructors to experiment with new materials, new construction techniques, and new work practices, which in turn leads to further innovation.

We define generative capacity as the ability to rejuvenate, to produce new configurations and possibilities, to reframe the way we see and understand the world, to think out-of-the-box and to challenge the normative status quo. With no doubt, the implementation of digital 3-D CAD application has enhanced every aspect of generative capacity at Gehry's office, and at the same time also reinforced its operational efficiency.

Figure 2. A Product of 2-D CAD

Figure 3. A Product of 3-D CAD[2]

[2] Both buildings are designed by architect Frank Gehry using different CAD tools. Fig 2 is Loyola Law School, Los Angeles 1981; Fig 3 is the computer science and artificial intelligence building at M.I.T. 2004

5 DISCUSSION AND IMPLICATIONS FOR FURTHER RESEARCH

While the conceptual definitions of fit in the context of information systems are intuitively agreeable, modeling fit and defining it operationally are highly contentious issues. Most researchers do not explicitly model the role of fit, although most diagrams present 'fit' as an intermediary variable leading to improved performance. The best known conceptualizations of fit in information systems are cognitive fit (Vessey & Galletta 1991), organizational task-technology fit (Goodhue & Thompson 1995) and particular task-technology fit (Zigurs & Buckland 1998). All three treat fit as an intermediary variables affecting performance.

We submit that the role of fit as an intermediary variable affecting performance depends on the underlying assumptions about the nature of the phenomenon. Fit is often modeled as a *moderator* of the causal effect of user and task characteristics on performance. This reductionist view assumes that both the user and the task are exogenous—the task is "given" and the user is a pre-programmed entity with a known and set behavior pattern. Clearly, this does not apply in many instances, but it can be useful in others, and most importantly, it is easy to operationalize. Consider the following example: An American who knows how to type 'blindly' with both hands is expected to type faster than one who keys in characters with one finger, assuming a standard QWERTY keyboard. A good example of misfit is the American typing blindly on a French keyboard, which may actually result in lower performance than his 'slower' colleague. An adaptable keyboard that fits its layout to user characteristics would ensure high performance. In other words, in that case, the task is given and user behavior pattern is known. Thus, fit would moderate the effect of user skills on performance.

Fit can be modeled as a *mediator*, that is, fit can be conceptualized as a significant intervening mechanism that mediates the causal (and partially) indirect effect of user and task characteristics on performance. This view too assumes that the task is given, but contrary to the former model, it recognizes that fit has an effect on the process, or the user's behavior. Consider another common example. The American user (whose mother tongue is English) in France, logs into Webmail and receives instructions in French, which he translates into English to decide how to forward a message. Adapting the interface language to the user's mother tongue relieves the user from the process of translation. This change in the process is expected to affect the performance. We find it easier to model this effect as mediation. While technically it is possible to formulate this example also as a moderating effect, it would shift the focus away from the intervening effect of the state of fit (as described above) to the interaction between fit and the user-performance relationship. Moreover, if we can explain how a particular fit variable changes an outcome by intervening in the process leading on to the outcome, then it is useful and feasible to use the mediation perspective. It is useful because it provides insight into effective design. Without understanding the impact of design on the process, we are less capable of optimizing design.

Zigurs and Buckland are the most explicit in specifying the role of fit in their model. Building on Venkatraman's (1989) classification of fit, they argue that for GSS task-technology fit the most appropriate conceptualization is "fit as profile deviation," which regards fit as "a profile of theoretically related variables (that) is specified and related to a criterion variable" or as "feasible sets of equally effective alternative designs" (pp.322-323). This perspective is somewhat more general than 'fit as mediation' because it is not limited by the number of variables modeled and allows more degrees of freedom.

So far, the proposed conceptualizations of fit treat the underlying phenomenon as isolated cause-effect snapshots. This works well in simple instances (such as in our previous examples), but fails to provide a faithful picture of the role of fit in the overall relationship between users, tasks, and information technology. Fit, and particularly generative fit, has a clear long-term effect on modifying users' behavior through learning and through its impact on work practices. Thus, we suggest that the effect of fit is conceptualized in dynamic models that account for its effect on a user's adaptive behavior.

So far, task performance, the outcome of good fit, has been conceptualized and operationalized in the literature mainly with *task-related* efficiency-based criteria (e.g., measures of task efficiency, accuracy, or productivity) and to a lesser degree with *user-related* affective-based criteria (e.g., user's overall well-being, health hazards, or positive affect). This study has been concentrated solely on task-related performance and, like most of the literature, does not cover user-related criteria. Regardless of the unequal coverage in our study and in the literature at large, we firmly believe that both task-related criteria and user-related criteria are equally important measures of task performance. Building on parallel work (Csikszentmihalyi 1990), we believe that generative fit has a critical impact on user-related affective-based performance criteria and particularly on the user's well-being. Future work should examine the relationship between user-related criteria and generative fit and generative capacity, and how generative fit can be fine-tuned to enhance a user's well-being and positive affect.

6 CONCLUSION

Building on the conceptualization of generativity in social sciences at large, we have contextualized it in the information systems milieu and suggest the two corresponding constructs—generative capacity and generative fit. We submit that generative fit enhances generative capacity, that is, it produces or assists users in the production of new configurations and possibilities, fresh and innovative ideas, and out-of-the-box thinking that challenges the normative status quo. Using a case study on the impact of 3-D representation technologies in the AEC sector, we have illustrated the possible contributions of generative fit and the resulting implications of elevated generative capacity to collective learning, work practices, and overall performance.

We have set the foundations for further research of generative information systems and proposed top-level considerations in reference to generative design. Further work should develop measures of generative fit and benchmarks of generative capacity; refine our understanding of generative design; seek ways to enhance generative fit and identify technologies that are conducive for generative capacity; extend the concept of generativity to other interrelated areas of information systems; investigate further the determinants of generative capacity and study its systemic and long-term impacts.

Imagine a technological frontier where people's wildest dreams are about to unfold in a world unlike anything we could have ever imagined. The study of generativity sets course to the development of platforms that enhance creativity, unleash unconventional design, promote innovation, and are instrumental in revitalizing our epistemic stance.

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