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Performative, Informative and Emotive Systems The First Piece of the PIE

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ABSTRACT

- This paper distinguishes computer and communications systems that 'perform' from those that 'inform' and those that deal with emotive aspects of problems. It indicates some of the ways that performative systems seem to differ from the other kinds, why this distinction is important to both users and designers, and suggests research—some of it currently underway—to investigate this area. Results from this research will allow us to improve existing performative systems and to expand the domain of their application.

Introduction

Ten years ago many knowledgeable people began predicting the 'paperless office.' During the past decade we have continued a technological revolution that has improved imaging, transmission, and processing capabilities far beyond what we were even dreaming of then. Yet we still have lots of paper in our offices.

- Perhaps part of the reason is that much of our paper does more than *inform* us. It has a role, condoned by many centuries of use and recognized in our legal and governmental systems as well, in *performing* functions. While we moved rather easily from paper to electronic *information*, the move from paper to electronic *performance* has not gone so easily. This paper proposes some research that will help us to understand why.

Performatives

- We normally think of a communicated expression as conveying information, and when this occurs we may speak of the informative content of an expression. For example, when someone says "Reagan beat Carter in the 1980 presidential election," this expression communicates a certain fact, and we may speak of the expression as being either true or false. The statement
- made by the expression is its informative content. But there are other uses of language, other ways we may use
- our expressions. In exclaiming "Help!" for instance, we display an emotion-distress. So, expressions may have emotive content in addition to informative content.

- There is a third way to use expressions, and that is to make something happen. Some expressions—called performatives—by their mere utterance make things happen. Standard examples are "I'll meet you for lunch, Tuesday at one," and (from an umpire in a baseball game) "You're out!" When I say I will meet you Tuesday at one, I am not predicting that I will meet you, I am promising to meet you and in so doing am creating an obligation for me to appear at lunch. Similarly, the umpire is not (or not exclusively) describing a fact (that you are out); instead, the umpire is declaring—making it true that you are out. Saying so (in that circumstance) makes it so.

- Expressions—whether informative, performative, emotive or whatever—may be communicated in a variety of ways. We may speak, we may write, we may talk into the telephone, we may use electronic mail, we may have computers send non-textual messages for us, and so on.
- Technology supports our utterances, and information systems technology is an important part of our utterance-supporting infrastructure. Just as verbal utterances may be informative, performative, or emotive, so information systems technology needs to support all three aspects of our communications. But, the performative and emotive aspects of communication have not been sufficiently understood or attended to by information systems research. It is our purpose, in what follows, to begin a systematic discussion of performative expressions in information systems. We leave to later consideration the questions associated with emotive aspects.

- In this paper we shall see that performatives are quite common, even essential in business and that information

¹In the Orient this is sometimes called a "chop," and it consists of a carefully carved stamp containing a person's name or an organization's symbol.

technology already is supporting performative communications. The support, however, has been *ad hoc*, and not informed by a general awareness, let alone a theory of performative communications. We believe that such a theory is needed and that when available it will be useful to designers of information systems.

THE PERVASIVENESS OF PERFORMATIVES

Although a fully adequate characterization of performatives is difficult, in practice it is fairly easy to recognize an expression with performative content. The root idea is that performatives make things happen. Moreover, copying, individuation, and authentication are features more important for performative expressions than for the purely informative utterances. To take a simple example, anyone can state a fact, but only the umpire can call you out. The shouts of the fans, however loud and angry, just do not count in this matter. Similarly, a copy of a promise is not a new promise (although it is possible to mistake a copy for the real thing). Referring to a particular Tuesday, it does not matter how many times I repeat my promise to meet you for lunch, I have made only one promise. And as my check is a promise to pay (i.e., is a performative expression), a copy of my check is not a new promise to pay. A copy of a book is a book, but a copy of a check is not a check.

Performative transactions are basic to modern economies. Consider the most elementary form of exchange; barter. Bill trades a bag of bananas to Sam for a sack of squash. As a direct exchange, it has no interesting performative aspects. However, suppose Sam's squash can not be harvested until a month later, in which time the bananas will spoil. Instead, Bill agrees to give the bananas now for Sam's *promise* to deliver the squash later. The promise is a performative utterance. It obligate Sam to some future action.

This raises another issue. What is to keep Sam from renigging on this promise? Typically, promises of this type entail some sort of enforcement, e.g., an appeal to Sam's gentlemanly honor or perhaps some more concrete form of collateral. A major part of contract law is devoted to the enforcement of such obligations. As suggested by this example, performative transactions often arise in business when there is a difference in the timing of the delivery of money, goods, or services between the parties to the transaction.

A familiar type of performative document is the *ticket*, e.g., movie tickets, tickets to sporting events, bus, train, and plane tickets. Once purchased, these entitle the holder to a certain service at a later time.

Other examples are accounts receivable and payable, which represent deferred payments for immediate de-

livery of goods or services. The invoice sent to the customer is thus a performative document. More generally, contracts of all types are performative. They create a mutual obligation between the parties. Purchase orders and other forms of sales contracts are common examples. Leases and rental agreements also involve a contractual performative.

Perhaps the most important class of performatives in business are financial instruments. A note to a bank is a performative document, representing an obligation to pay at some future date. Bonds are, of course, similar. With coupon or bearer bonds, the paper document itself is performative—it represents the right to future interest and principal payments. With registered bonds, the performative record is the company's books which list the bond holders. Stock certificates are also performative documents, entitling the holder to dividend payments and a proportional share of the residual assets in the event of liquidation.

Other types of financial instruments can be performative; for example, checks and credit card slips. The most common type of financial performative is, of course, money itself. Their value is not in their substance (e.g., paper), but rather in their symbolic role as a unit of economic value.

The examples above refer mainly to documents representing rights or obligations. Another important type of performative represents permissions or privileges. Examples are easements, patent licenses, and franchises. A doctor's prescription is permission to buy controlled drugs.

Performatives representing permissions are less common than obligatory performatives in business transactions. They are, however, quite common in relation to regulatory and other governmental agencies. For example, a driver's license is a performative issued by the state permitting the holder to drive on public roads; a visa is a permit for a foreign citizen to enter the country. Many types of legal papers are also permissive performatives; for example, papers of incorporation and SEC filings. Building permits, road use permits, etc., are also of this nature.

Many transactions within an organization also have a performative character, e.g., inter-departmental orders, budgets. Much of the so-called red tape in bureaucracies involves the processing of performatives (Lee, 1983).

PERFORMATIVE TECHNOLOGIES

The linguistics literature on performatives concentrates mainly on performative utterances—oral communication. Examples of spoken performatives in business are oral

contracts or purchase orders made by phone. However, performative transactions often require a more permanent record. Up until the current developments in telecommunications and computer technology, these performative records were mainly in the form of paper documents. (But a farmer once wrote a check by carving it into a watermelon.) This paper technology for performative warrants examination as a model for the requirements of handling these transactions electronically.

- Performative documents are often distinguished from purely informative ones by the presence of a personal signature. The signing of contracts is an example. Bank checks and credit cards are other signed, performative instruments. Likewise, the processing of many bureaucratic documents often involves the signature of the agent of one or more officiating departments.
- Another common characteristic of performative documents is the presence of a special seal or stamp¹ (e.g., a company logo or the stamp of a travel agent). These are analogous to signatures for the institution. It is the act of signing or the application of the seal or stamp that is the social 'performance' that initiates the legal effect of these documents.
- Aside from these signature aspects, another frequent feature of performative documents is the unusual texture or coloration of the document itself. Official stationary, for example, sometimes bears a raised seal. Various types of tickets have a special pattern or cut to them. Bank and traveler's checks have an unusual background pattern and texture. In the same way, most currencies are printed with intricate patterns on special paper.
- These physical features of the document itself point to a particular problem in the handling of performatives, what might be called the 'reproducibility problem.' With the advent of photo copier technology, copies of black and white documents could often be made indistinguishable from their original. For purely informative announcements, reports, etc., this is a desirable feature.
- However, for performatives easy copiability is undesirable. This is basically the problem of forgery: by reproducing the document (ticket, card, bill) one reproduces the right it represents.

Thus, the use of color prevents copying on black and white photocopiers. Special textures and/or magnetic markings make reproduction even more difficult. An interesting side effect of the improvements in imaging technology is to make this important problem even more difficult to handle.

Current developments in information technology encourage the representation of documents in electronic form. In this form reproduction is perfect and instantaneous. Again, while this is a strong advantage for purely

informative communications, it raises difficulties for managing performatives.

Illustration—Travel

- There is an interesting mixture of performative and informative information processing in the purchasing of airlines tickets and the rest of the actions associated with getting a seat on an airplane. The airlines have been in the business of performing actions based on electronic signals for more than two decades. Along with the funds transfer system to be discussed in a moment, this is one of the earliest examples of developing information systems that perform as well as inform.

The typical transaction, which offers a bewildering number of different alternatives and options, illustrates some of our points about performatives quite nicely. Let's take a look at one such transaction in some more detail.

When we buy a ticket, two major things happen. First, we arrange somehow (via cash, checks, or credit) to make a payment to the airlines or travel agent issuing the ticket. Second, the airline issues us some evidence (we call it a ticket) which guarantees us (within the limits of overbooking) a place on one or more particular planes.

This ticket is a performative document. While we can replace it if it gets lost or stolen, it is nevertheless a document treated with some care by the airlines, and it contains the airline's 'chop' (i.e., it is written on their ticket stock and it contains the authentication stamp of the original issuer). Possession of this ticket is a *prima facie* indication of our right to the passage indicated on its face.

Later, we generally obtain another piece of performative paper, namely a boarding pass or ticket envelope which indicates our right to a particular seat. In the not so distant past this document was never created until the flight opened for seating just prior to its departure, but now with improved information processing capability we often can get boarding documents issued at the point of ticket purchase.

Our last official act as a traveller, handing in the ticket, marks only the commencement of a long journey for this remarkable piece of paper. The ticket is collected and then processed as an invoice of the airline on which the trip is taken, drawn on the airline that issued the ticket (and received the original payment). The process of clearing the ticket is just about as complex as that involved in the clearing of a check, passing from the airline to Air Inc. and finally to the airline of original issue (like a check passes from the bank where it was deposited to the Federal Reserve).

It is interesting to note that in an increasingly electronic age, we still count on paper so much. We might ask if this

doesn't help us to understand why the checkless (or cashless) society promised as early as 1964 still hasn't arrived (even though we do have lots more transactions which are purely electronic).

From the standpoint of performatives we might also usefully spend a little time looking at the differences between airlines tickets and railroad tickets. Generally, the railroad ticket just indicates right to passage, and has only a passing role in billing and helping to perform the monetary transfers. As a result we speak of 'punching' a railroad ticket to change its deontic state, while generally we 'collect' an airline ticket and leave the traveller with only a copy.

Illustration—Banking

- Performative communications are, and have long been supported by information systems technology. The most prominent example is that of EFTS systems (electronic funds transfer services) which have existed since the days of the telegraph. When a funds transfer is performed, the information transmitted does not simply say that money is to change hands, the transmitted information plays an instrumental part in making the transfer come about. We shall now examine—briefly and from a performative point of view—the various funds transfer technologies available.

There are not very many ways in which money is exchanged.

The U.S. payments mechanism provides for the transfer of funds between economic agents. Almost all funds are transferred by one (or more) of the following means: (1) cash, (2) paper or electronic checks drawn upon demand deposit accounts at banks, and (3) wire transfers between banks using Federal Reserve reserve accounts (Humphrey, 1982, p.1).

We might, in the present context, distinguish paper and electronic checks, thereby finding four basic funds transfer mechanisms.

If we are only concerned with informative communication, it may be difficult to distinguish these four funds transfer instruments: cash, paper checks, electronic checks, and wire transfers. But they are different and what makes them different is largely their performative properties. For example, one way in which these instruments differ is their reversibility. There is an important sense in which a cash exchange is not reversible, while an exchange of checks is. After all, if you have the cash you can spend it. If you have someone's check, it may bounce. As Humphrey notes:

“Credits for deposited checks can be reversed (usually for insufficient funds at the bank upon

which they are drawn), but all wire transfers are final or nonreversible when made, even if the bank fails later in the day” (1982, p. 2).

Seen in this light, wire transfers are equivalent to cash transfers, while electronic and paper checks are equivalent.

- The distinction between cash and checks—just as the distinction between electronic checks and wire transfers—is a distinction measured in differences in performativeness. Cash is money whereas a check is a promise for money. There is a third category of EFTS which, for lack of a better term, we shall call electronic cash management. Electronic cash management services, in our sense of the term, allow a user to move funds among accounts owned by the user. No transfer of ownership is involved. So, electronic cash management services perform different actions than wire transfers or electronic checks.

EFTS is a generic name, covering all sorts of electronic funds transfers. It is significant, however, that the various EFTS systems can be distinguished quite nicely by their performative properties. Consider, for example, the following list of EFTS systems (Beehler, 1983, p. 308):

1. Fed wire
2. Automated Clearing Houses (ACHs)
3. CHIPS
4. Bank wire II
5. SWIFT

The Federal Reserve wire system is an EFTS system for wire transfers of money. Its higher performativeness is reflected in its costs. A wire transfer is about 50 times as expensive as an electronic check (Humphrey, 1981). The U.S. automated clearing house (ACH) system is a system for clearing electronic checks. CHIPS is a special ACH, designed for use by New York City banks in clearing electronic checks written on international accounts held in New York banks. It is a measure of New York's importance as an international banking center that about 90% of international funds transfers are cleared through CHIPS. Bank wire II is, in our sense of the term, an electronic cash management network, aimed at domestic transactions. SWIFT is an electronic cash management network aimed at international transactions.

There is much more to say from a performative point of view about EFTS. Our purpose here is merely to demonstrate that there exist information systems whose primary purpose is to support performatives. EFTS systems are unambiguous examples. We turn now to the question of how information systems might further support performative exchanges of information.

Research Motivation

- So far we have presented and discussed an intriguing concept: performative information transfers. But for a concept or framework genuinely to be interesting, it must give us some insight into significant problems. We think the performative/informative distinction helps to shed light on, and promises to be very useful for understanding three important problem areas in information systems—information systems theory, design, and policy.

INFORMATION SYSTEMS THEORY

- When the question of what can be automated (by an information system) is raised, it is usually raised in the context of artificial intelligence and machine cognition.
- The above discussion of performatives can be taken to demonstrate that there is an aspect to the question that probably has very little to do with the intelligence, complexity, or knowledgeableness of the software. Airline reservations and funds transfer systems may be enhanced by incorporation of machine intelligence, but that intelligence is not the main action. Something else is going on and that is the systems' performatives; specifically, how the system interacts with its surrounding organizational or social environment.
- A related point can be made, as we have said, about office automation. An oft-stated goal is "the paperless office," but there is general agreement that the goal is distant and the velocity of approach is slow. One suggestion, drawing on the above discussion, is that much of the paper flow in organizations is substantially performative and that present office automation systems are poorly designed substitutions for performative paper transactions.
- Finally, it is worth noting that enlarging the realm of the automated (for example, by replacing paper-based performative transactions with information systems) may not always require new technology. The problem may be one of rearranging social organizations or of finding new configurations of existing information systems technology.

DESIGN OF INFORMATION SYSTEMS

- There are many interesting opportunities to apply the concept of performative transactions to the design of information systems. We mention just two. First, one would expect both the economics and the justification of performatives to be different from that of (more strictly) informative systems. This might be reflected in the centralization/decentralization of decisions. Second, in automating (or supporting) an activity involving per-

formatives, there may be significant opportunities to make the process inherently more efficient by performing it in an entirely new way. For example, an information system can be used to lower the cost of processing checks. Reading the account number off the checks, for instance, replaces a step that would otherwise have to be done by a person. But entirely replacing paper checks obviates the need to read a check at all (but not, of course, the need to assign a transaction to the proper account). In this case it may be said that electronic check systems make check processing inherently more efficient.

POLICY FORMULATION

American firms dominate the world market in international informative information flow, e.g., database access, remote data processing (Fishman, 1980). Such trade is normally thought of as a basic resource, and concern has been expressed about the consequences of American dominance.

For many developing countries, a key issue is that most of the value-added benefits resulting from the over-all production process occur at the processing and distribution stages and hence do not normally accrue to the developing countries. Similarly, certain spin-off effects (such as incentives to research and development, stimulation of related economic activities and, in the specific context of trans-border data flows, production of software) also may be associated with processing and distribution rather than with the production of the raw material—be it mineral resources or data (United Nations, 1982, p. 55).

- Whatever legitimate area policy issues arise in, this regard for informative information flow (which is what the above passage is referring to) must be greatly amplified for performative systems. Very little data is available about the comparative economic values of trans-border performative versus informative data flows, but the former surely is much greater than the latter. It is known, for instance, that about 90% of international dollar-denominated funds transfers occur through CHIPS, which has an average daily volume exceeding \$150 billion. CHIPS (Clearing House Interbank Payments System) is located in Manhattan and owned by about a dozen New York banks.

Those who doubt the international political significance of CHIPS would do well to recall some of the Carter Administration's actions during the Iranian hostage crisis.

With the above discussions of the larger research and application issues associated with the performative/informative distinction completed, we shall now discuss more specific research topics related to this distinction.

Research Agenda

CONTEXT AND SOCIAL CONVENTIONS

- Performatives, as we have described them, seem almost magical: one does certain incantations which (by themselves) make things happen. Nonetheless, performatives are perfectly ordinary and commonplace. The things that change are not merely physical; rather, they involve changes to social relationships. This leads to the observation that it is not the communication alone that is performative, but its role within a certain set of social conventions or rules.
 - For example, an umpire cannot just say "You're out!" under arbitrary circumstances; these words become performative within the general rules of baseball and only during its realization in the event of a particular baseball game. Correspondingly, the policies and procedures within a firm establish the rules that give rise to performative communications within a company. For instance, the assignment of departmental budgets may require certain evidence and authorizations. Other examples are inter-departmental work orders and payment credits, employee salary changes, reimbursement claims, etc., all of which are performative within the system of a particular organization.
 - Many (perhaps most) transactions between firms or institutions are also performative. Examples are sales contracts, purchase orders, bank transactions, or tax payments. These may be regarded as open market transactions between independent legal entities. The set of rules controlling these types of performatives is the applicable code of commercial regulations and laws (the Uniform Commercial Code in the US and GATT or similar international agreements about trade).
- Performative transactions between firms may also be controlled in a more narrow context, such as a trade organization membership or consortium. For example, a hand signal in the floor of a commodity exchange is performative to those members; likewise, CHIPS transactions are performative only to bank members of that consortium.
- The general point is that understanding of performative communications, and more specifically the requirements that must be maintained by any electronic system managing these communications, is determined by the applicable social framework or context. To be effective, any electronic system to manage performatives must either satisfy these conventions or else allow us to establish new ones.

ELECTRONIC MONEY

Paper currency is surely one of the most ubiquitous forms of performative documents. It is not information in the sense that it reports some fact; rather is a repository of monetary value. Yet the physical medium of currency seems an unnecessary inconvenience; it has to be stored, it is easily damaged, lost, or stolen, etc. Yet the available electronic technologies, the 'cashless society' has been slow in coming.

- The reason for this, we claim, is that the social conventions that control the use and function of money have not been properly recognized. These conventions have evolved over centuries of use of physical currencies, and have become largely implicit in our cultural socialization. These conventions need to be made explicit and thoroughly understood in order for any electronic replacement to be effective.

CONTRACTUAL PERFORMATIVES

- An important class of performative communications involves transactions between firms that have a legal significance, that is, governed by commercial laws and regulations. The example here is contracting: the performative creates an obligation from each party to do some service, to deliver a product, or to pay a certain amount of money.

An approach that may help to clarify the analysis of these types of performatives might involve what is know as 'deontic' logic. These are logics for reasoning about social norms. Typically they include operators such as:

- O a = action 'a' is obligatory
- W a = action 'a' is waived
- P a = action 'a' is permitted
- F a = action 'a' is forbidden

These constructs are inter-definable; i.e. using obligation as the primitive construct,

$$P a \leftrightarrow O a$$

that is, to be permitted to do something is not to be obligated not to do it; and,

$$F a \leftrightarrow O a$$

that is, to be forbidden to do something is to be obligated not to do it.

A hypothesis for further research is that the key types of performatives arising in contractual situations relate to changes in deontic status. Common examples are:

- oblige— some action not obligatory becomes obligatory;
- waiver— some obligatory action becomes not obligatory;
- permit— a forbidden action becomes permitted;
- forbid— a permitted action becomes forbidden.

These are four of the eight possible changes in deontic status that seem most common. If we are able to establish this relationship — namely, between performatives and changes in deontic status — we may then find it very useful to pay as much attention to deontic variables in systems design as we already do to variables involving money.

CONDITIONAL (OR CONTINGENT) PERFORMATIVES

In ordinary English, some performatives are categorical (“You’re Out!”); others are tentative, conditioned upon some event or fact (“I will if you will”). Similarly, a pre-authorized electronic funds transfer is a performative conditioned upon time. Beehler (1983, p. 344) writes that:

The willingness of the corporation to sacrifice disbursement float directly affects the cash manager’s decision to use EFTS services. This is and will remain the primary impediment to overcome in use of EFTS services.

There would seem to be no reason why an EFTS transaction could not be conditioned—in this case conditioned on time—in order to eliminate float loss and to gain the cost benefits of electronic checking. So the general research question is, “What, if any, are the special requirements of conditional performatives?”

SECURING PERFORMATIVES

Huey Long said, “An honest politician is one who once he’s bought stays bought.” There is a distinction between the uttering of a performative and the securing of it.

Our legal and moral systems, even our system of etiquette, can be seen as devices for securing performatives. If a performative is a promise, it needs to be secured against denial, so we might insist upon having a signed and witnessed document. Tickets, as we have seen, are performative documents. They need to be secured against duplication so tickets are normally constructed—as is currency—with an eye to frustrating the counterfeiter. Could there be an electronic ticket system? Well, very roughly, the issuing agent could send you a number which you could copy down and give to the ticket taker.

But numbers are easily duplicated. How does the ticket taker authenticate the bearer of the number? One way would be as follows. Digits on the ticket number concatenated with the purchaser’s password could be recorded on the ticket seller’s database. In handing over the ticket, one inputs the password and the ticket number. The ticket taker runs the algorithm for check digits, verifies they are on the database (or verifies that the output is coherent), notes that the ticket in question has been used (i.e., punches the ticket), and yields access to the service.

What seems to be happening here is that a locus of uniqueness has changed from a paper ticket to unique numbers held by the user and by a database. Is this a general principle describing all information system support of performatives? What (besides authentication and protection against denial) is required for securing a performative? How is this different, if at all, from the problem of individuating a performative? These and many other questions remain to be answered on the subject of securing performatives.

DIGITAL SIGNATURES

The electronic ticket example above implicitly described use of a digital signature. When and under what circumstances can digital signatures be used to secure performatives? Are there different requirements for authenticating a performative and, say, witnessing it?

An important distinction between digital and written signatures is that almost anyone could key my number into a computer, but almost no one can passably forge my written signature. Can we accept this difference and still make a digital signature system work (after all, if I keep my number to myself no one can get it) and if so, under what circumstances? How can we eliminate this difference between digital and written signatures? Can a power of attorney system be implemented with digital signatures? What would be required?

REDRAWING THE BOUNDARY

Some stunning things have happened when the boundary line between performative and informative systems has been moved. Recently, some companies, such as American Hospital Supply, have converted information systems into systems which do things, apparently to their considerable profit. In fact, this company seems to have been successful enough with their performative systems to have ‘earned’ a number of Department of Justice anti-trust actions.

Many companies may find it useful to review the opportunities that are presented at the borderline between

informative systems and performative systems. We think that there may be many circumstances where moving this border a little in the direction of performance will produce some stunning results.

A NOTARY PUBLIC FOR BITS

The problem of *individuation* was mentioned earlier. Perhaps it would be worthwhile to create a 'Notary Public' for bits, not unlike the ones we currently have who generally devote their attention to notarizing paper documents. If this proves to be useful there are a number of very interesting research questions that can be raised, not the least of which is to what extent could this kind of function itself be automated. There are a number of tantalizing prospects in this area that warrant further consideration.

Conclusion

The following passage is accurate and it nicely articulates the basic attitude of users and researchers regarding information systems.

Information is a resource. It makes alternatives known, reduces uncertainty about their implications, and facilitates their implementation. Hence information, appropriately applied in the pursuit of well-defined objectives, is central to decision-making. And, increasingly, decision-making depends on access to a great variety of data, which have to be stored and processed on computers to make them manageable (United Nations, 1982, p. 48).

Our purpose in writing this paper has been to argue that the above statement tells only part of the story. Information systems can (and do) do much more than provide access to an important resource—data. Information systems do things; they make things happen. Recognizing this performative aspect of information systems will be essential to expanding the realm of the automated by substituting information systems for paper-based systems found in offices and general commerce.

paper-based systems found in offices and general commerce.

Performative transactions are everywhere. Some of them are now supported by information systems. If we hope to improve that support or to extend to new areas, then much research remains to be done, especially on performative transactions in general and on implementing performatives in information systems. We hope only to have made a case for pursuing it.

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