The Evolution of Electronic Commerce In Practice:  
Issues, Challenges, and Needed Research

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Introduction
At a growing rate, the corporate mandate to have an online business presence is expanding from interorganization systems to broader forms of electronic commerce. Although, it is not clear how these forms will evolve, it is evident they represent fundamental shifts in electronic commerce (EC), with significant implications for business in general. Waiting to see how the promise and possibilities of EC will evolve may appear the safest strategy in the short term, particularly for those firms that are averse to high risk. Yet those companies that wait may not gain the necessary experience and knowledge to capitalize on the opportunities that may emerge.

There is a great deal of hype about the future of electronic commerce. Well known market research organizations frequently publish expectations about the magnitude of business that will be conducted online. Journalists also freely report the experiences of a well-known set of firms that have launched business sites on the WorldWide Web. Yet experts in the field seldom debate the likely evolution of electronic commerce. Moreover, industry experts have not presented agendas of needed research.

A panel was assembled at the International Conference on Information Systems which convened in Atlanta. The panel consisted of industry experts who, by nature of their responsibilities and experience, are in touch with companies around the world who are seeking to capitalize on electronic commerce. All are also attuned to effective research practices and can address pointedly the most critical questions that need to be addressed.

Panelists included:

Frank Braski, Senior Architect, Lotus Notes
Erica Rugullies, Electronic Commerce Industry Analyst, Giga Information Group, USA
Bob Scott, Director of Internet Commerce, Cap Gemini, UK
Peter H. M. Vervest, Managing Director, Multimedia Skills Group, The Netherlands
Jim Senn, Georgia State University, Moderator

The stage for this session was set with a series of issues and challenges concerning the reality of electronic commerce, company experiences, and current and expected developments.

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Electronic Commerce… Reality?

“The big news is not that business is being conducted electronically… The big news is that failure to do so creatively, quickly, reliability, and cost-effectively now puts the enterprise at risk…

Are These The Right Exemplars?

• Amazon.com
• virtualvin.com
• HotHotHot.com
• smokinjoes.com
• cdnow.com
• schwab.com
• isn.com
• pointcast.com

Key Questions Focusing The Panel Session

1. How has the electronic commerce industry segment evolved and where is it today?
2. What are the critical issues and challenges facing the industry?
3. What’s working and what’s not?
4. What are the areas where further research is needed?
**Question #1:**

How has the electronic commerce industry segment evolved and where is it today?

Peter Vervest challenged the frequently quoted visions of electronic commerce. He indicated that such widely quoted sources as Forrester Research (e.g., “Internet commerce will grow from $8 billion to $327 billion in goods and services traded between companies by the year 2002”) severely understate the potential volume of activity.

A view suggested as more appropriate, and also more expansive, regards electronic commerce as: “buying and selling through electronic channels.” This view leads to four distinct ways to view the buyer/seller relationships:

<table>
<thead>
<tr>
<th>BUYERS</th>
<th>SELLERS</th>
</tr>
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<tbody>
<tr>
<td>one</td>
<td>many</td>
</tr>
<tr>
<td>electronic retailing</td>
<td>EDI</td>
</tr>
<tr>
<td>electronic markets</td>
<td>electronic procurement</td>
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In each area of focus, electronic commerce must offer more added value than the alternative in order to succeed. The challenges are multiple.

**Challenges**

- design & certification of ‘trustworthy’ trade procedures
- e-commerce settlement systems
- management of networking capabilities
- order fulfillment: modular design of business networks of trade partners
- sustainability of new business relations
- and more ...
Question #2
What are the critical issues and challenges facing the industry?

Opening comments on this question, led by Frank Braski, pointed out that 70% of the world’s wealth exists in cyberspace. Moreover, market research by IDC/LINK predicts a 20% growth in online commerce by 2001. Of note, Braski pointed out, is that more than $68 million exists in some 1 million e-Schwab accounts (the investment firm Charles Schwab) alone. In general, firms capitalizing on electronic commerce today are already finding it is lowering their cost of doing business (e.g., airline ticketing costs involving electronic tickets are dropping to 1/8th of their previous levels while bank transaction costs are found, in some banks, to be less than 1% of their prior costs).

Critical issues can be grouped into the categories of human factors, socio-economic, and technology.

### Issues and Challenges: Human Factors

**Basic F.U.D.**
- Misconceptions about credit, banking
- Technical Illiteracy

**The I/0 Problem.**
- Finding what you really want.
- The need for speed.

- Those that don’t “get” it...
  - Stupid applications of technology

### Issues and Challenges: Socio-economic

- **New Economic Models**
  - Consumptivity - We value our worth by our level of consumption
  - Consumerism - The consumer is king!

- **New business models**
  - Self-service, JIT Everything, NOW!
  - New Supply Chains: Dis- & Re-intermediation
  - Entirely new businesses based on-line
  - Traditional S&M being turned upside down
Braski grouped the technology issues related to electronic commerce into three distinct areas:

1. Security and accountability
2. Scalability and efficiency
3. Integration and ease of use

**Issues and Challenges: Socio-economic**

- **Political & Legal**
  - Obsolete laws & government structures
  - Ridiculous Encryption Laws
  - Transnational economic powers
- **Moral & Ethical**
  - Is it okay to base insurance premiums based on known spending habits?
  - Should I use positional tracking to determine speeds for driving rates?
  - Should all this information really be connected?

**Technology Issues: Security & Accountability**

- **Common Misconceptions about Security**
  - “That it’s inherently there.”
  - “My kid can do it.”
  - “They’ll steal all my money.”
- **59% of Americans won’t give out Credit Card information online - ECONOMIST**
- **Authentication.** Not just who gets in and who’s out, but are you really who you say you are?
- **Realtime Intrusion Detection Systems**
- **Who’s responsible for security?**
  - You.
  - Your partner.
- “On the web, people really DO know you are a dog.” - Anonymizer
- **The systems can track more than we want them to...**

**Scalability & Efficiency**

- **Business will boom, and that will be great, right?**
  - Not if you can’t handle it.
- **$176B by 2001, 136m “hits” a day**
- **55m w/web access today to .5B by 2000**
- **New computing systems**
  - **Agoric Systems:** Selling off efficiency
  - **Neural Nets:** Learning to trade
  - **Intelligent Agents:** Bartering on your behalf
The assertion underlying all of the electronic commerce issues raised in this question was direct: The future of electronic commerce will depend on the ability of firms to deliver more value to consumers while incurring lower costs per transaction compared to other alternatives. Moreover, customer service for both business-to-business and business-to-consumer activities will gravitate toward increased value-added support (except for those Braski termed “brain-dead” tasks, where self-service will be sufficient). Finally, collaboration will occupy a special place in electronic commerce, i.e., people working together with groupware that lets the whole be greater than the sum of the parts.

**Question #3: What’s working and what’s not?**

Bob Scott served up a fast potpourri of business examples from throughout Europe and the United Kingdom. Five themes were vividly illustrated.

Channel management opportunities offer particular potential for new business successes. These cases suggest the importance of conceptualizing electronic commerce as much more than just what is happening on the WorldWide Web. For instance, a bank in Spain choose to expand, quite successfully, its channels through use of the Web to reach other customers who prefer to do their banking in Spanish.

Companies making investments seem to recognize that successes will not come overnight. Many see that for the long term, electronic commerce and the Internet will be their main market mechanisms.

Electronic commerce applications that span industries, blurring traditional boundaries, have proven extremely effective for some companies. Examples discussed include supermarket chains that have begun offering online banking and even broader financial services. Surveys have indicated that for these firms, more than half of the people questioned are handling all of their banking at these supermarkets. These applications

Integration

- How can we leverage our existing systems?
- How do we manage all of the myriad of Transactions?
- How do we get it all to work together?
  - Smart People
  - Open Systems
  - Free Language
suggest that branding of virtual Internet service providers (in this case virtual banks) with
backoffice systems of existing business will continue at an accelerating rate.

Culture is an important determinant of electronic business success, as well as a means for
identifying opportunities in consumer driven businesses. For instance, in France an
exemplary project enables consumers to obtain credit pre-approval through completion of
Web-based forms. When the credit is to be applied to a purchase (e.g., a “big-ticket” item
like an automobile), the credit-granting firm and the seller go online via video
conferencing to complete the transaction.

Similar examples can be found in other countries (e.g., Norway and the Netherlands), and
in both business-to-consumer and business-to-business services activities. The
implication is that electronic commerce applications that carefully consider cultural
matters have a higher likelihood of success. This is particularly important in light of the
vast reaches of Internet-based commerce.

Scott emphasized that companies that have chosen *not* to develop their electronic
commerce applications alone seem to enjoy important successes. Partnering makes it
possible to combine knowledge in hardware, software, search engines, and buyer/seller
preferences. Assembling the right mix of knowledge and experience appears to be a key
issue in those electronic commerce applications that are working well.

**Question #4: What are areas where further research is needed?**

Erica Rugullies’s firm, the Giga Information Group, is an example of a new business
model build around electronic commerce and conducting business online. GigaWeb is a
vehicle for delivering research products and services related to information technology as
a whole.

Rugullies emphasized two categories of research:
(1) Issues related to intranets and extranets
(2) Issues involved with selling products and services over the WorldWide Web.
Panel Discussion

Question: Do you think the industry analysts and market researchers are casting the electronic commerce net too narrowly?

- I actually think that it is being cast, in some ways, too narrowly. What I’m seeing is an expansion of the use of the term electronic commerce and an expansion of the products covered by industry analysts. The number of products and services included in a closely held analysis database has expanded beyond 500. You’re seeing vendors from all “walks of life”, such as enterprise-wide reporting products, small business packages, and accounting packages offering electronic commerce functionality. It’s burgeoning out of control. The electronic commerce term—the electronic commerce segment is doing nothing but growing.
• Electronic commerce is manifesting itself in 3 domains. The Internet space is all about business-to-consumer electronic commerce. The intranet space is about business-to-employee, or _intra_business, electronic commerce. The extranet space is obviously about business-to-business commerce. What I’m seeing is more money being spent on intranet commerce and extranet commerce than on Internet commerce.

• In sheer size of expenditures and activity, there’s more money on companies trading within their own environment than on the open Internet. That’s quite an important thing to think about. We need research, and research funding, to look at where the market is actually developing. From my experience, intranet and extranet commerce are the areas of growth at the moment.

**Question:** Is it a mistake to tie electronic commerce closely to Internet commerce?

• I would say that would be missing quite a large part of the activities that are going on at the moment.

• In terms of software products and companies that are offering solutions for electronic commerce, the vast majority of them are for buying and selling over the web. Advertising utilities, advertising management tools, Store-front creation tools, merchant servers…most of the products on the market are for buying and selling goods over the web.

**Question:** Are we then in disagreement?

• Disagreement in terms of where the technology market is. But in terms of where the money is, and where the value is for businesses, I absolutely agree that intraorganizational and transactions among trading partners is where it’s at.

• We need meaningful research in this area. We need some figures that don’t change week on week.

• Our research has found that, with respect to the consumer market, the home shopping technology preferred the telephone, the television, and the Internet (in order). So whilst the market for Internet technology-based products may be a vastly burgeoning market, if you look to the people who really matter—the consumers—they prefer to buy by way of the telephone…at least at the moment.

**Question:** What do we call this thing? Is electronic commerce an industry, a segment of an industry, a tool, a way of thinking, or something else? How should we properly characterize electronic commerce?

• It’s more than just a tool. It’s more than just an industry, because it crosses every industry boundary.
• Today we have electronic commerce vice presidents and electronic commerce experts in a lot of companies. As electronic commerce filters down into business functions, it will disappear as entity itself.

• I have to think about it as just a tool. We’ve got to understand why people want to use this tool. Today the challenge for researchers is to come up with a good framework that analyzes the application of this thing called electronic commerce.

• It’s business, but not as you know it. It’s a way that companies will do business in the future. It will become ingrained in part of their processes, their people, their culture, their minds, and partnerships that they have. I can’t define it as an industry. It is not an industry. It transcends all industries, whether you’re a service company, a pharmaceutical company, a retailer, or a bank. And you see the blurring of the boundaries between those industries themselves. For instance, retailers are becoming banks and banks are becoming retailers. There’s just a blurring of boundaries between segments of industries. Electronic commerce is one of the fuels that encourages even more the blurring between industries and the entering of new markets as well as the barriers between competitors coming down more quickly. So…business, but not as you know it.

**Question: What is the state of the art with electronic cash?**

• There is a great deal of activity in the area of microcurrency, but there has not yet been a great deal of adoption. Methods and systems are proprietary and can only be used for a certain type of applications—very consumer-oriented applications (e.g., games and distribution of information in small increments). I expect those software-based systems to disappear in the face of smart cards. When stored value smart cards emerge (in the U.S.), we’ll use those smart cards for the small transactions as well as for larger ones. In terms of using other types of e-cash, I don’t see much happening. For example, DigiCash, out of Europe, is struggling to be seen as viable in terms of acceptance and adoption. Most people (in the U.S.) are paying with credit cards. Businesses are paying with the traditional mechanisms.

• There is a great deal of work being done in the area of bill presentment and bill payment. This mechanism is designed to make it possible for consumers and businesses alike to go to Web sites or have HTML pages delivered to them through a product such as Quicken98 whereby they can pay bills directly, having them debited from a checking or other bank account. We’ll see a great deal of that, which will be termed electronic checking, I suppose.

• I’d like to add that in Europe, digital cash now has a lot of use. Electronic purses and I-Pay (Internet Pay) are also getting a lot of attention.
Question: What are some of the other research issues?

- One of the important research issues is ‘What are the economic implications for business?’ What are the societal changes of electronic commerce if people are going into shops less often? We’ve also conducted research that has shown that people are not prepared to pay extra for goods that are purchased by way of the Internet or the telephone. One interesting facet of that is that currently items that are purchased through catalogs or from mail order houses are actually charged for at the ‘premium.’ And the consumer doesn’t know it. Price transparency will become very visible on the Internet. With the advent of the Euro, price transparency becomes even more visible. Companies will thus begin to wrestle even more with how they will sell an identical product in another country at a price that appears to be, say, 50% less than in their home country. Shoppers will seek to buy the product, electronically, in the country having the cheapest price. So, there are some key issues about pricing and price elasticity as well as the manner the macro/microeconomic modeling of pricing that have not yet been resolved. Payment mechanisms aside, actually setting prices is an area to investigate.

Closing
It’s clear from the discussion that something is happening. This area will only grow in importance.

We’ve tried to do the impossible in this session—trying to deliver a topic for a full day’s discussion into a one and one-half hour session. I hope this session has served to stimulate your continued thinking on the work to be done in this area.
Bios of Panel Members

Frank R. Braski
Internet and Notes Computing Practice
IBM Global Services

Mr. Braski is an I/T Architect in the Internet and Notes Computing Practice which concentrates in collaborative computing and the delivery of business value as enabled by distributed application platforms such as Lotus Notes and the Internet. Members of this practice are practitioners in business strategy and planning methodologies, life-cycle solution methodologies, rapid development (RAD) methodologies, object-oriented design and development, and information delivery. Mr. Braski's specialty is in architecting solutions with Lotus Notes and Domino, technology consulting and transferring development skills, with an emphasis on large scale system development and web-based electronic commerce projects. He is experienced with and can help others develop in Lotuscript, Java, Javascript, HTML, and CGI with Domino, as well as Domino.Connect. Earlier in his career, he was directly responsible for all software design, development and implementation of programs for the accurate collection of data for manufacturing and scientific laboratory equipment and interfacing it with Lotus Notes. He designed data collection and inventory systems for pharmaceuticals, universities, and manufacturing companies.

Mr. Braski has consulted for, architected or authored software and documentation for major clients such as AT&T, Ciba Vision, Equifax Information Services, Holiday-Inn Worldwide, ING North America, Shaw Industries, Southland Life Insurance Company, The Coca-Cola Company, the FDA, UPS, and the IBM Insurance Industry Business Unit.

Erica Rugullies
Giga Information Group

As an industry analyst at Giga Information Group, Erica Rugullies specializes in electronic commerce. She covers a wide range of business-to-business and business-to-consumer electronic commerce technologies and trends. These include Internet-based procurement systems, electronic bill presentment and payment, merchant servers, one-to-one marketing, payment systems, storefront creation tools and packages, and Internet EDI.

Prior to joining Giga, Rugullies was a research analyst at Hurwitz Group, where she focused on electronic commerce and information security and was a regular contributor to The Hurwitz Report, a monthly industry newsletter. Under the information security umbrella, Rugullies analyzed products, companies, and technologies in the areas of access control, single sign on, security administration, identification and authentication,
firewalls, virus protection, and encryption. Rugullies has hands-on project management, application development, and systems and network management experience with Novell NetWare, Lotus Notes, and Internet e-mail.

Erica Rugullies has a BA from Harvard University.

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**Bob Scott**  
**Cap Gemini UK**

Bob Scott is Director of the Internet and Electronic Commerce business for Cap Gemini in the UK. He is a member of the Cap Gemini Global Internet Team (CapWeb) and represents the UK in the Applied Knowledge Management (AKM) and Electronic Commerce (ECOMM) transnational teams.

He joined Cap Gemini in 1992, through a facilities management contract with British Coal and became the Business Development & Marketing Manager for the Information Consultancy division which grew to over 300 consultants and a turnover of £30m.

In 1995 he became the head of the Operational Research Consulting Group, comprising 100 consultants specialising in Simulation, Optimisation, Business Modelling and Data Mining.

He holds a BEng degree in Mining Engineering from the University of Nottingham and an MSc in Operational Research from London School of Economics. He has recently completed the inaugural Cap Gemini International Business School at the Cap Gemini University in Behoust, France.

Prior to entering Management Consultancy he was a Production Manager in British Coal.

He is a Council member of the UK Operational Research Society.

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**James A. Senn**  
**Georgia State University**

James A. Senn interacts regularly with business leaders and information technology executives around the world. His areas of expertise include electronic commerce, corporate strategy, organization transformation, corporate innovation, and the management of information technology. He is Professor and past chairman of Computer Information Systems program at Georgia State University in Atlanta, and director of an industry-related research group focusing on the management of information technology. Senn is the author of numerous white papers and published research reports as well as a series of highly regarded books on information technology.
Peter H M Vervest is Managing Director of Multimedia Skills Group, an international consultant group in project management, technical and business skills, in telematics, telecommunications and multimedia.

During his earlier 10-year career with Philips International of The Netherlands, he progressed from sales to senior marketing and project management, and became Divisional Director with Philips UK. He has been particularly known for turning existing organizations into new business fields and active pursuance of client orientation and responsiveness.

He is Professor of Telecommunications Management at the Erasmus University Rotterdam (NL), and lectures and publishes regularly for international audiences. He has published several books (with English and Japanese translations).