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From competitive advantage to social welfare

— An interview with Eric K. Clemons

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Background information

This interview with Eric Clemons complements Electronic Markets' special issue on Social Welfare Computing. It reflects the long experience of an information systems scholar who started his career in the 1970s. In 1976, Eric completed his Ph.D. in Operations Research at Cornell University and has been a professor at The Wharton School at the University of Pennsylvania since 1976. In 1994, he was appointed Professor of Operations and Information Management as well as Professor of Management at Wharton and held this position until his retirement in 2021. He remains emeritus and is currently a Visiting Professor at the

Law, Management, Politics, and Philosophy Department of Copenhagen Business School, Denmark. In his work, Eric has authored influential publications on the strategic impact of information technology (IT), in particular on competitive advantage (Clemons, 1986), the role of interorganizational systems like Economost from McKesson Drug company (Clemons & Row, 1988), the impact of IT on interorganizational relations with the move-to-the-middle hypothesis (Clemons et al., 1993), and the changing role of online content in the successful launch of new companies without reliance upon traditional advertising (Clemons, 2008). In his recent research, he has coined the notion of Social Welfare Computing that reflects a shift from the impact of IT in the business world to how IT impacts social and political processes (Clemons et al., 2022a).



Eric K. Clemons



Rainer Alt

How would you describe your long journey in academia?

Let me explain this with my current situation. I am currently in Copenhagen in a European Law school because I was invited by my colleagues here. This was despite my not knowing any EU law and it reminded me that I was teaching for a while at Peking University Law School, which seemed like a good idea at the time because I didn't know any Chinese. The idea was to constantly position myself where I have to be challenged and which allowed me to challenge things. We all learn best when surrounded by talented people whose work we don't initially understand. We learn when we are overwhelmed by new material and need to find tricks to force patterns of understanding to emerge. What my 1986 papers on competitive advantage and the 2022 papers on regulation to defend society might have in common is that they all follow the same trick, which I did not actually consciously understand until two or three years ago. It is inspired by the punctuated equilibria theory of Eldredge

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and Gould (1972) in evolutionary biology, which modifies Darwin's theory of evolution to suggest that species mutate slowly at a more or less constant rate. Instead, it says that things may be static for hundreds of thousands, sometimes tens of millions, of years but then something changes in the environment and species adapt very quickly. Often this is enabled by a tiny adaptation that occurred previously, but enables the species to seize a newly vacant ecological niche. Apple did not slowly modify the way we use phones, it more or less created mobile computing. Google exploited this and continued the movement away from Microsoft and the desktop. Amazon's recent explosive growth combines its capabilities for online sales with the transformative needs created by Covid. My unifying theory for the last 40 years is that technology punctuates existing equilibria.

Could you elaborate on an example?

Let me explain this with one of my earliest experiences with unpublishable research. It was a paper that Harvard Business Review wouldn't publish in 1993 because at the time they believed that outsourcing was not relevant to executives or government officials, and that it would never become a matter of interest to any senior decision maker. Nevertheless, I started studying outsourcing because there is a limit to what you can pay somebody to do for you. Whatever this limit was at the time, it was clearly going to change as a result of IT. This is determined by what he or she actually does when you are paying them by the hour, and by the accuracy with which you can observe what they are doing. The first limitation is traditionally called the principal-agent problem: your agents will do whatever earns the most money for them, even if it is not what earns the most for you. I used to play a game with myself, in which I was to guess how the person on the other end of the telephone was paid: if she talked to me for 48 min about her favourite places to hike, she was paid by the minute, and if she got off as soon as she thought I wasn't going to buy something, she was paid by the sale. However, if I can do instantaneous monitoring of the agent, then the principal-agent problem disappears. Another limitation to outsourcing is created by the need for colocation, where outsourcing organizations establish dedicated facilities near the client. As soon as you build anything that has only one purpose, that is, to serve a single client, you have lost all independence due to these relationship-specific investments. If the client refuses to continue to purchase services unless the vendor reduces prices, the vendor has very little freedom to negotiate. So, in 1992, I said: "What if there is going to be a technology that allowed me to monitor the performance of my agents and reduces the risks of the principal-agent problem? And what if that technology was general purpose, so that neither the agent nor myself is forced to make a relationship-specific

investment?" I didn't call it this wonderful new technology *The Web* because I didn't know it was going to be the Web. I just knew that *something* would reduce the risks of outsourcing, which make it newly easy to outsource.

Are there other economic consequences you anticipated with the Web?

I recall the first paper I wrote with Paul Kleindorfer, my most brilliant colleague at Wharton, on what if online search becomes so convenient that sellers have no choice and they *have to* participate in the search engine channel to reach their customers (Clemons & Kleindorfer, 1992). We asked what would happen if the value for the seller could be greater than the value for buyers. We found that the value for buyers comes from the speed and convenience of improved search, which might be several minutes and which the buyer might value at about \$10. The value for sellers is different and potentially much larger, since if the seller does not participate on the search engine the buyer will find a different seller and the seller will not make the sale. If I buy a ticket on United instead of American Airlines, the American plane takes off with an empty seat and the company loses the entire fare, which might be \$800 in revenue. Although the search engine is saving me as a user \$10, the value to me of improved search, it is actually creating an \$800 loss for American. Our argument at the time was that the cost to participate in an online search platform like the travel agent reservations systems was not limited by the value it creates for passengers, but by the value it can destroy for sellers. In this 1992 paper, we were actually extrapolating from systems that had been built in the 1970s and thinking of what would happen if search became more universal. This provided real insight into the profitability of Google search, even though neither Google nor the Web existed at the time. In hindsight, it was the same trick I described above and the one thing I knew how to do, which was to say "What would happen if?". As always, I was asking what might puncture the stable equilibrium of a business ecosystem, and how the system would adapt. Remarkably, it turned out relevant as shortly thereafter I received phone calls from the Chairman's office at British Airways, wanting to know if they could escape from the grip of the online reservations systems and avoid the systems' charges.

Is there another trick besides punctuated equilibria you can share?

Yes, there is an old trick I learned as a physics student: if one problem is too hard, double the size of the set of problems you are trying to solve and compare two very

different examples. If you look at what it would take to bypass the travel agency channel in air travel, how much information do you need to describe an airplane ticket? This is easy: you need to know where you are flying from, where you are flying to, what class of service you are booking, which seat you are booking or what is the price of the ticket. What does it take to describe a really good Wiener Schnitzel? How many words does it take to describe the typical market basket of a typical shopper checking out of a supermarket? How many words does it take to describe even a single piece of fruit, fish, or cut of beef? This is far more complex than the five things we need to know to describe an airline ticket! What does an online airplane ticket look like? It is called e-ticket and since I have to get myself to the plane there is no physical thing that the agency needs to deliver. What is a virtual online cup of tea or coffee worth to me? Of course, it's worth nothing. I do not need an e-coffee, I need real coffee in front of me. Likewise, I can't do much with a virtual steak or a virtual schnitzel or a virtual basket of fruit. So, if I think about what it takes to become an online grocer, as opposed to an online travel agent, I realize that one is easy to enter, the other is not. Americans shifted to online travel in a matter of months and to online grocery over the course of about 20 years. Online travel often involves interacting directly with the hotel or airline's website, but US consumers never buy paper towels online directly from Procter & Gamble and never buy ice cream or iced tea directly from Unilever. Could we anticipate that this would be the future structure of the online market? We asked what would have happened to the first company that threatened to sell directly to Walmart's customers? This wasn't hard to guess, and we were able to confirm our guess with discussions with suppliers to large retailers like Walmart and Home Depot. The interactions sounded like the following, with the retailer saying, *"We are still working on our e-commerce strategy, but we've already finished analyzing yours. You won't have one. The first day you sell directly to one of our customers is the last day we sell your product in our stores!"* This was followed with a simple statement of the percentage of the manufacturer's total annual sales that the retailer represented. Clearly, air travel was not only easy to enter as an online channel, it was relatively safe for the airline to offer online sales. In contrast, grocery and consumer packaged goods sales would be difficult to enter and unsafe for any manufacturer to attempt. We did not say that online grocery sales would not emerge. We merely said that online grocery sales would come from traditional retailers like Walmart or Lidl, or from newly created online sellers. We weren't precise enough to identify Amazon as ultimate winner, but we were accurate enough to guide airlines, consumer package goods

manufacturers, and travel agencies. Remember the second trick here. I found two extreme cases and compared them. It was much easier to understand each case after comparing them. So, the secret to my whole journey in information-based strategy is to think about punctuated equilibrium and look at the extreme cases!

How can you explain why online groceries did eventually experience strong growth?

You are right that grocery sales have gone online today, but not the way that travel sales have. Airlines and hotels book reservations and sell online, Unilever and Procter & Gamble still do not. My observation at the time was that it would be safe and easy for travel companies like airlines and hotels to bypass the agency distribution system, and that it would not be safe or easy for consumer packaged goods companies to bypass their retailers. It meant that when grocery sales did go online, it would not be through manufacturers' own websites, since they would not risk being punished immediately. Online sales would be provided through traditional stores, as Walmart and Giant did, or through new online stores like Amazon or FreshDirect. My original statement actually was not just about *what* would go online, but also *how* it would go online. In my later work with Lever Brothers in the US (today Unilever), I advised them to be ready for online sales and how to understand what would happen next during the response to the coming punctuated equilibrium. For example, every time I walk into a store, I see Unilever and Procter detergents, because there is only one physical store for everyone. If, however, I enter an online store, what I am going to see is either what I want to buy, if I care, or what the retailers wants me to buy, if I don't have a preference. In case I have a favourite detergent, I will certainly see it, since the online store learns from my shopping and never wants to make me search for what I want. But if I don't care, they will show me a sponsored link and a sponsored link will be whichever a company is most profitable for the seller. This often involves the manufacturer being forced to make payments to the online retailer. The power such a gateway company has over manufacturers is in fact enormous and represents a real and growing problem. My advice to companies like Unilever was that *"You will sell online and online grocery will happen, but it will come either from the retailer itself or from a third party that cannot be punished by an existing retailer. Moreover, in some ways this is going to be a painful transition for you."*

Why did you change your research focus from business to non-business issues?

In my career, I spent about thirty years looking for things that I could do for businesses. I repeatedly had contacts with top-level decision makers from major businesses such as British Airways, Merrill Lynch, AT&T, Barclays, and Unilever. This experience with corporate strategy provided useful lessons for my students. More recently, I stopped looking at what I could do working for companies and what I could get paid to do. I started looking at what I could do for Earth, even if I did not get paid. That was a fundamental transition: I stopped writing about what could I do for individual companies, and started writing about how society could control the risks associated with giant online technology platform companies. There are threats that I think are just as real as climate change, and many of them are not being addressed. My Wharton position allowed me access to many people. For example, as I became interested in privacy I was lucky enough to discuss critical trade-offs with an American Secretary of Homeland Security, learning about the trade-offs between individuals' rights to privacy and the government's legitimate needs to protect itself and its citizens from terrorism. How can surveillance for security be managed without impinging on individual rights? These issues seemed at least as important as the problems I had studied in corporate strategy, and they did not seem to be receiving the attention that they deserved.

How did you get started on this new path, away from working on strategy for big technology companies, and instead working on regulation of these same companies?

There was, of course, an element of chance. My first Facebook friends actually were Mark and Randi Zuckerberg. I talked to Mark about his plans for the company, years before Facebook's IPO. I didn't know why Facebook had to be free to its users, since anyone who couldn't pay a small amount every month for the service probably couldn't buy enough to be interesting to advertisers. Remember how much we were all paying every month for texting at that point, and a few dollars a month did not seem like a large obstacle for anyone. It was clear that Mark's business plan and revenue model were not based on providing valuable services to consumers for a small fee. They were based on selling access to those consumers and the manipulation of those consumers to any government, company, or organization willing to pay. Christopher Wylie's book, "Mindf*ck: Cambridge Analytica and the Plot to Break America" (Wylie, 2019) documents a couple of the best-known examples of

this sort of manipulation. Kara Swisher has documented that Cambridge Analytica did not hack Facebook—they came in the front door and used Facebook exactly as its designers intended. The potential was clear at the time Facebook was created, even if no one was interested, and this emerged as my current research interest. I am no longer the only one with these concerns. Rabbi Lord Jonathan Sacks prepared a broadcast for his BBC series on ethics, noting that human societies undergo increasing stress as their populations grow beyond the small group size that was ideal for early human hunter gatherers, and that social networks can be and are used to exacerbate these stresses (BBC, 2018). Journalist and Nobel Peace Prize Laureate Maria Ressa has described social media companies like Facebook as existential threats to civilization and democracy (Lemma, 2021), and she may be correct. It is not certain that profit-based business models based on selling engagement and manipulation created by fear and anger are consistent with peaceful human societies. In brief, I realized that online social media had a business model based on getting and keeping us angry. It's hard to truly love more than few people, but we can effortlessly hate entire groups without knowing any members of the group. I made the switch from strategy to regulation to help ensure a dignified life for my child and my grandchildren.

What would be your recommendation for future business models for online social media?

Answering this question is much harder since making us happy occurs on an individual basis, while making us angry can be achieved in big bunches, on an industrial scale. You also have to ask how to develop a transition to attract users away from a system that is already free, that connects them with an audience that can measure in the millions and offers them enormous freedom of expression because it is not constrained by bounds of decency, safety, or privacy restrictions like the GDPR. Why would anyone give up a social network that is really exciting, allows you to operate without restrictions, and has enormous network benefits, for one that is not and does not? I also asked myself, whether it is possible to make a social network attractive without making it manipulative and exploitive. My colleagues at Copenhagen Business School have worked with me to explore how punctuated equilibrium analysis should be applied to specific bodies of regulation. Professor Teilmann-Lock explored how copyright law should be relaxed (Clemons et al. 2022b). The reasoning is that copyright law exists to protect all of society, not just creative artists, by balancing assured supply of innovation against assured and affordable access to innovation. Ensuring supply entails protecting creative

artists, while ensuring access entails limiting the scope of protections awarded to creators. Modern technology makes creative and valuable reuse easier and more valuable. Thus, it follows that whatever balance had been optimal in the past is now too restrictive and that copyright protections should be relaxed. In contrast, Professor Jan Trzaskowski has reasoned that consumer protection law exists not to prevent consumers from making bad decisions, but rather to ensure that consumers are able to make good and informed decisions if they choose to do so. Consumer protection law emerged with the industrialization of food production and sale, since consumers no longer had adequate information about products created in distant factories, and unfair and manipulative advertising exacerbated consumers' emerging information disadvantage. Whatever degree of protection may have been adequate in the 1890s and the 1950s is clearly no longer adequate today, when large platforms know what each consumer is willing to pay and know how to manipulate the preferences of most online shoppers. In contrast with the work with Teilmann-Lock, the work with Trzaskowski seeks to strengthen rather than to relax consumer protection laws (Trzaskowski, 2022). As before, these two examples are very different, and comparisons between the two helped the work with both of my colleagues.

From your experience, what developments should we expect?

This is another difficult question and I see the possibility that we are approaching a temporary technological equilibrium. For instance, the first industrial revolution was based on the steam engine, the second industrial revolution was based on mass production and the telephone as well as the telegraph, and there was a significant gap of maybe 100 years between them. There was progress of course, but we still think in terms of these two revolutions. Now we can talk about the information systems and the internet revolution, which started in the 1970s and gave us nearly universal high-speed access by the start of the twenty-first century. There was enormous change over those thirty years. In 1970, I was online from home at 300 baud, and now I enjoy speed from home of over 500 million bits per second. In 1967, the largest machine IBM shipped had 640 KB of RAM and the largest possible machine, given the 360's addressing architecture, would have been about 16 MB—a single photograph on my digital camera now requires over 52 MB. After this enormous change in technological capability in just a few decades, and the equally dramatic business and societal changes that occurred as a result, it is possible that we are going to just take a deep breath and learn to accommodate the societal adjustments that have to be made. The industrial

revolution not only created incredible wealth, it also created enormous poverty that it actually looked like civilization would rip itself apart. I have the same concerns about some of the technologies we already deploy. When Adam Smith wrote about the comparative advantage of nations, there was the general belief that there would always be some work that each person was capable of doing. Each person who lost a job to automation would train and “up-skill” to something better. I am not sure that this is true anymore. When AI can do the work of a radiologist, with four years of university education, four years of medical school, internship, residency, and one or more post-docs, what, exactly can this highly skilled middle-aged professional do now? The historical record suggests that new technology always creates jobs, but I am not sure whether this is still true. No one has the muscle power to compete with a steam engine, and no one wants to. But there is now a silicon floor, a skill level below which AI can always do the work better than some people. As the silicon floor rises, are there people who can no longer compete with AI, just as they can no longer compete with a steam engine? What will happen to people who have dedicated decades to developing skills that are no longer marketable? I think we are going to spend considerable amounts of time learning to work with the technology we already have and adapting society. That is actually an optimistic guess. A pessimistic guess is that big tech entrepreneurs will get richer while those below the silicone floor just get angrier and look for someone to blame, and that big tech giants will continue to profit from exploiting their fear and anger. Eventually we may indeed rip ourselves to pieces.

Finally, do you have any recommendation for information systems students in these times?

Actually yes, and it is a very unpopular recommendation. My students love big data analytics because it appears concrete, it is fashionable, and with sufficient work they can eliminate any ambiguity, get “the right answer,” and get an “A” in the course. Actually, they are learning to solve concrete and uninteresting problems, and systematically avoiding critical, strategic, and more difficult ones. This will not make them good executives. It doesn't even make them good big data analysts, since they will never be able to compete with students who received their graduate training in statistics and computer science, and not in a business school MBA program. If traditional business schools focus only on big data analytics, they will not have a future. Instead, students should learn to address strategic ambiguity and learn how to solve the problems that silicon cannot yet solve. I will not expect them to be saving the planet yet, but I expect

them to be able to solve problems like how to use non-lethal economic tools to deal with major-power military aggression. Most importantly, my students should understand how complex systems evolve along with changes in information infrastructure, and they should not be surprised. In an ideal world, their solutions to the problems they solve would also make the world a better place to live.

Dear Eric, thank you for this insightful interview!

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