

Communications of the Association for Information Systems

Volume 44

Article 7

1-2019

From Technology Revolution to Digital Revolution: An Interview with F. Warren McFarlan from the Harvard Business School

Michael Milovich

Rowan University, milovich@rowan.edu

Follow this and additional works at: <https://aisel.aisnet.org/cais>

Recommended Citation

Milovich, M. (2019). From Technology Revolution to Digital Revolution: An Interview with F. Warren McFarlan from the Harvard Business School. *Communications of the Association for Information Systems*, 44(1), pp-pp. <https://doi.org/10.17705/1CAIS.04407>

This material is brought to you by the AIS Journals at AIS Electronic Library (AISeL). It has been accepted for inclusion in *Communications of the Association for Information Systems* by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.



From Technology Revolution to Digital Revolution: An Interview with F. Warren McFarlan from the Harvard Business School

Michael Milovich Jr.

William G. Rohrer College of Business
Rowan University
milovich@rowan.edu

Abstract:

In this paper, I recount an interview I had with F. Warren McFarlan, DBA, a senior scholar whose passion to keep working in information systems (IS) overrode his two attempts at retirement in 2004 and again in 2009. His 50 years of knowledge builds on experience from companies in the United States and Asia, both large corporations and start-ups, and for-profit and nonprofit companies. Additionally, he has helped develop the minds of generations of business leaders through his work at the Harvard Business School (HBS). Through the years, he has developed and taught IS case studies on companies that range from Chase Manhattan Bank to Alibaba. Given his enduring work in technology, these interviews provide interesting insight into coursework development at HBS, the frequent redefinition of the digital native, the language of business versus that of IT, a management stance on IT, the management of IT projects, work on for-profit and nonprofit boards, and a view on China and IS.

Keywords: IS Courses, Digital Natives, Business Language, Outsourcing, Portfolio Management, Deliverer of Service, Builder of IT Solutions, For-profit and Nonprofit Boards, China.

This manuscript underwent editorial review. It was received 02/20/2018 and was with the author for 5 months for 2 revisions. Steven Alter served as Associate Editor.

1 Introduction

Since his graduate work, Warren McFarlan's involvement in the Harvard Business School (HBS) has concerned information systems (IS). He has influenced the management information systems (MIS) course material as it has been integrated into the major programs at HBS since 1962, when the school rolled out its first MIS course. With the focus of his work on MIS, he has authored and co-authored books, articles, and case studies on companies that range from legacy companies in financial services to Internet startups. His first-hand experiences stem from case writing field research and serving on for-profit and nonprofit boards.

McFarlan's career includes his appointments as Albert H. Gordon Professor of Business Administration, former senior associate dean of the HBS, and currently professor emeritus. He has served for more than 30 years on both for-profit and nonprofit boards and has written many books, articles, and case studies in the areas of MIS and social enterprise. McFarlan earned his AB in 1959 from Harvard University, his MBA in 1961 from HBS, and DBA in 1965 also from HBS. He became a full professor at Harvard in 1973. His many roles in the business school have included setting up senior management programs in Switzerland and associate dean positions as director of research, director of external relations, and director of the Asia Pacific.

McFarlan's focus in business has been MIS since his graduate work, and his first co-authored book appeared in 1966. He was also the third editor-in-chief of *MIS Quarterly* from 1986 to 1988 (Zhang, 2015). He has had several roles at Tsinghua University, such as the lead in developing case studies on more than 40 technology-based companies in China and a guest professor. He continues to teach courses in the Executive Education program at HBS.

I interviewed McFarlan to capture his experience on the changes in information technology (IT) from the start of the technology revolution to the contemporary digital revolution. He has had a front-row seat through his work. This interview, which I present in edited excerpts, focuses on a senior scholar in the IS discipline who offers a vivid example that "old [professors], you see, don't fade away; they just keep coming back for more" (stevieboy247, 2009).

Together, we conducted two interviews. The first interview focused on questions about McFarlan's published works in addition to the changes he has seen in the IS courses in Harvard's MBA program, the generations that have attended universities, and the IT roles and leader requirements of the discipline. From analyzing the first interview, I identified seven themes that I used as a structure to interview McFarlan again to address probing questions in some of the themes and to seek his reflection on all the themes captured.

The paper proceeds as follows: in Section 2, I provide McFarlan's initial responses from the first interview about his publications. In Section 3, I recount the first interview more fully and organize the responses around the seven themes I identified after actually conducting the interview with him. In Section 4, I recount the second interview with McFarlan in which he reflected further on these themes. Finally, in Section 5, I conclude the paper with McFarlan's response to a question he has longed to be asked.

2 McFarlan's View of His Publications

An initial question about McFarlan's book publications created the foundation for the discussion that follows.

MM: You have authored or co-authored 11 uniquely titled books with many editions. Which book, regardless of its age or relevance in today's business environment, is your favorite work, and why is that?

WM: Actually, I have three favorite books. The first one is my very first book, *Management Information Systems* (Dearden & McFarlan, 1966), back in 1966. It was the first book written on MIS and was part of my graduate work as a research assistant with Professor John Dearden¹. The case studies in the book were reflective of current practice. This was the first book to present case studies in MIS written as it was at the very beginning of the field.

¹ John Dearden became a full professor at Harvard University in 1964. He was known for his expertise in management accounting and innovation in the use of computers for business.

The second book is *Corporate Information Systems Management* (Cash, McKenney, & McFarlan, 1988), which I co-authored with Jim Cash and Jim McKenney in 1988. It was the second edition of the book that caught the turn between IT management on the one hand and IT as a competitive weapon and provider of strategic advantage on the other. This was the first time we clearly demonstrated how IT deeply impacted the overall firm.

Totally unrelated to IS is the work I've been doing for the last 35 years in the social sector, and that would be my book *Joining a Nonprofit Board* (Epstein & McFarlan, 2011).

MM: Your fondness of the book *Joining a Nonprofit Board* (Epstein & McFarlan, 2011) comes about because of the length of time you have spent in the social sector?

WM: It turns out that about 80 percent of HBS alumni are involved in social enterprise in one way or another. In some complicated way it balances out their life psychologically. I've been a part of social sector activities for 37 years, serving on nonprofit boards continuously since 1980. It was during my second attempt at retirement that I wrote this book. The book had been on my mind for some time, and in 6 months I wrote a series of ideas on what distinguishes for-profit governance from nonprofit governance. I think it came together so quickly because I had been doing a lot of work with art museums, schools, hospitals and civil service agencies over the past decade. I had been working on for-profit world boards for a similar length of time.

MM: It is a unique progression of titles to go from 1966, when MIS first brings value into a company, to 1988, when IS brings strategic advantage into a company, then to 2011 and giving back to society.

WM: There is one more book, called *Can China Lead?* (Abrami, Kirby, & McFarlan, 2014), which is a part of the work I've been doing for the last 15 years in my key role at Harvard to build intellectual bridges between the USA and China. In this role I've made 91 trips between Boston and China. This book looks beyond the economics of today's world and looks at the strain lines and pressures of tomorrow. We took a management researcher, me, and a China historian, Bill Kirby—who had been dean of the faculty of Arts and Sciences at Harvard—and a macro-economist, Regina Abrami, and wrote a cross-disciplinary book. The ability to work together on this cross-discipline forward-looking book project was very exciting. These four books comprise the key elements of my professional life for the last 50 years.

3 The First Interview

McFarlan's interview had seven themes: 1) development of IS courses at HBS, 2) redefinition of the digital native, 3) language of business versus language of IT, 4) management stance on IT, 5) management of IT projects, 6) work on for-profit and nonprofit boards, and 7) a view on China and IS. In this section, I detail our conversation according to each theme.

3.1 Development of Information Systems Courses at Harvard Business School

MM: We know that IT is becoming an everyday business requirement as much as a strategy. When you think about China leading and today's changing business plans, how has that connected to the case studies you've done?

WM: Basically, it was through developing case studies that got us into Chinese companies, which enabled us to understand what they were doing in IT. Almost immediately we discovered very different approaches to IT from in the West. Fortunately, as a result of Bill Kirby's role change at our university we were able to recruit him to HBS. With Bill and a full-time Chinese-speaking research assistant, we developed a case-study-oriented MBA course called "Doing Business in China." Thereafter, I was able to expand further the program from China using the nine research assistants at the Tsinghua University case center. The connection to China first flowed out of developing technology cases at HBS. Then came the case development activity at Tsinghua University when I was able to tap into their network of companies.

MM: The MBA course "Doing Business in China" leads me to the next question. MBA programs, including that at HBS, no longer require a course in MIS. Do you think that's a problem?

WM: That's a very interesting question because the reality is, at one time we did have a required course at HBS. What happened was IT just became more and more important and began to suffuse every

part of our curriculum. For example, when I look at the way we teach marketing today, at every step along the way there are cases dealing with databases and with data-enabled distribution strategy. We have basically built IT content into almost every course. HBS has been unbelievably supportive of IT. Therefore, many of the different disciplines all wanted to do their own IT materials development. Very importantly, as a school we have developed eight initiatives that focus on issues outside of any one discipline structure (Harvard Business School, 2018a)². One of the largest is our digital initiative, which involves nearly half our faculty. This initiative has been underway for 3 years and has administrative staff for bringing speakers regularly onto campus, helping with the development of cases, etc. There are faculty work groups that meet every week on the digital as well as the other initiatives.

Stepping back to talk about technology confidence for a moment, the students on campus have become massively comfortable with using technology. For example, in Harvard College, the largest course in the Liberal Arts College is “Computer Science 50”. Over 900 students enroll in the course. Even our undergraduate students understand that this is the world that they’re going to have to live in. In a funny way we won the war by losing the battle. In our current curriculum at HBS, our students find that almost everything has digital technology at the center.

MM: With HBS’s reputation for bringing case studies into the classroom as a learning tool, how do you think IT academics should bring research into the MBA classroom?

WM: It depends on the careers the MBA students are interested in pursuing. One group of students today is involved in creating companies, innovating and, in short, is entrepreneurs. Another group of students is preparing for financial or manufacturing institutions, which is not nearly as massive as it used to be. Most of the students are not on a career path to work inside the IT industry. Those types of students might have been at HBS 30 years ago; however, that’s not the mix of students we have today. Yet, there are a huge number of IT jobs, which interest MBA students at other schools. Their programs are therefore structured differently from our program. There is still ample need for those interested in IT to learn about project management, the issues of project management across different systems, the coordination of standards, and on and on. Those curricula are rich and *needed*.

MM: Is what you are describing a curriculum program that must be developed through insight from the student culture at each university?

WM: Yes, different institutions will have entirely different focuses.

3.2 Redefining the Digital Native

MM: Thinking about suffusing technology and employees as the most important asset in an organization, we know that technology consumerization has created the digital natives, which is a generation raised on technology that are about 18-34 years old. These workers are moving into middle management. How are these knowledge workers going to disrupt the business use of technology as we move into the next 20 years?

WM: They’re doing it already. I remember back to the digital natives in the early 1980s. Our students were working with pocket calculators, with computer terminals all over the building. I was made in charge of the MBA program, although I hadn’t taught in the program for 16 years. A couple of weeks after I started, the dean said, “The reason I’ve done this is I want you to really use computers and get the students much more technologically aware.” Then, about 2 weeks later, he said, “Oh, and by the way, the more money you spend the better.” That was when the notion developed that every student would actually have his or her own computer. Those students were basically the digital natives in that day. To our students’ great horror, they actually had to know either VisiCalc or Lotus 1-2-3 because these spreadsheet software packages became the language of business. The students tried to push back and one of my colleagues, the head of the finance course at that time, said: “That’s ridiculous. You’re telling me that you don’t need to understand spreadsheet programs

² The Harvard Business School Initiatives are 1) business and environment, 2) business history, 3) digital, 4) entrepreneurship, 5) gender, 6) healthcare, 7) leadership, and 8) social enterprise. These initiatives are research centric and include faculty, student, and alumni engagement with business practitioners. They focus on developing critical thinking on topics that affect business around the world.

on your final exam in finance on May 28th but Goldman Sachs expects you to be completely spreadsheet knowledgeable on June 1st when you go to work there as a summer intern? Give me a break.” He ended the debate.

As a digital native of the time, I watched my daughter as the first person in her high school to have access to word-processing capabilities. It completely destroyed the leading English course in the school, known for the harassment students went through redrafting and addressing a red pencil marked-up paper. My daughter would take the markup, go to her word processor and in 35 minutes she did everything. She would then watch a TV show. For each generation there is a new layer of IT stuff to master. A new problem that corporations deal with is people adversely selecting out of being hired by a company if that company doesn't have the modern-day kinds of IT capabilities.

It's all very well for a company to say that they don't believe in Twitter, but if the generation doesn't give up the right to have tweeting capabilities they adversely select the company. The people that come out of each generation position “digital native” for redefinition: every couple of years society gets to decide what a digital native is, and which parts of IT are most important. I am surely obsolete now, but the piece of software that I use on my desk the most is Google. That software transforms every paper I write. For everything that I do, current information is simply pulled up to my fingertips. Also, I understand the notion that for the younger generation I have to text but for the older generation it's okay to email. I can't survive without both kinds of communication capability.

MM: What you described is an earlier time when a student may not be hired because he or she lacks technology abilities versus a modern time when a student may not choose to work at a company because the company lacks technology. How should a company focus on digital natives as employees?

WM: It's really interesting because we have to answer the question, what is a digital native? The digital native definition changes and changes and changes. One answer is, of course, that the current people working with technology tend to be very young. For example, I think about my daughter who is head of HR at an internet services company. At 44, she's practically the grandmother of the organization. The average employee is 25 years old in a company of about 5,000 employees, so they're all digital natives at the absolute cutting edge of technology. The 30-year-olds aren't as with it, and the 40-year-olds are another step back.

MM: People just a decade or two younger may be seen as the new digital natives when compared to yesterday's digital native?

WM: Yes, the definition keeps being redefined from the bottom up. For example, a digital native's formative experiences begin somewhere in 7th, 8th, or 9th grade. So, what is the definition of a digital native? It's in the context of the time when you start developing your technology skills. The biggest problem is that people have to be able to learn, change the way they think, and communicate with technology. Otherwise, before they know it, they're suddenly no longer a digital native—they're just a practitioner of a technology that no longer exists. Their time has simply passed.

MM: Thinking of digital natives as people framed in a technology of the time, would you offer a thought on what today's digital natives should think about as they embrace technology versus resting on their accumulated knowledge?

WM: It has to be a “continuously curious” look at new ways of doing things. What are their colleagues doing in new ways? It's a lack of curiosity that is so often the downfall. They haven't looked for a new approach because the technology they currently use works. It simply blinds them to new technology and how their job may suddenly be transformed.

3.3 Language of Business Versus Language of Information Technology

MM: As a paradigm shift, we expect IT managers to have business acumen. However, when we look at the integration of IS coursework in management classes, are we really looking for functional management to grab onto IT acumen?

WM: Yes, and what's interesting is this issue goes back to the very beginning of the MIS field. I'm having fun putting together a talk for an upcoming conference. The theme is 10 case studies that I've written over the years, what has changed and what hasn't changed in management. The very first

case study, a case written with Glenn Overman, former dean of the College of Business at the University of Arizona in 1961, is called “Harmony Life of Hartford” (Overman, 1966). I need only change the nouns to modern-day words to bring it up to speed for today; it’s exactly the same issue — the issue of cutting across two cultures: the technology culture where we know the databases and the data structures, and the marketing culture where we need to plan and understand the user-driven market opportunity. It turns out that the Harmony Life case represents a timeless issue in the field of MIS.

MM: **Is it appropriate to summarize that there are a number of language approaches for the aspiring IT executive: they have to command the language internal to the organization, command a language to address topics outside the organization, and then they have to learn the language of the board?**

WM: It’s not just learning the language; it’s what I call the “command presence,” which includes the ability to operate confidently at a senior level. Starting off in smaller organizations is the way to develop a presence. For example, I did not start on the board of a Fortune 500 company. I started on a board of a consulting company with 100 employees. A group of MIT professors founded the company. They asked whether I would do some consulting work, and I said that actually I wasn’t interested in an advisory board role but that I would be interested in an appointment on their main board.

Over the company’s years of existence sometimes our sales went up, sometimes they went down, we learned how to cope, and we developed war stories. We personally internalized the importance of cash flow, innovation, and reinvention. The company was sold to a large services company. I had developed enough industry and board experience that 6 months later I was asked to join the board of that services company, then with a couple of billion dollars in sales annually and about 26,000 employees. It was the experience in that smaller board that gave me the confidence and credibility to be able to work comfortably with the CEOs on the boards of larger companies. When you get on one board, then suddenly other board appointments come up. I was always able to manage three appointments to for-profit boards and a major nonprofit board appointment as well.

MM: **Are business leaders skeptical of even tried and tested technology solutions when an IT executive lacks clarity in his or her language to discuss the solution in business terms?**

WM: I might put it slightly differently. It’s absolutely incumbent on a successful IT executive to have complete fluency in the language of the business and to be able to take information and frame it in a business context. I need an executive talking about technology in ways that are relevant to the business and in a language that is relevant to the business. Over and over again, IT people know different technology languages and have different technology skills, about databases, data architecture, and so forth. But they simply lack the ability to stitch together a sensible conversation with an end-user who doesn’t have those skills. It has often been said that it’s easier to take an end-user and teach him or her technology language skills than to take a technologist and teach him or her the language skills that easily relate to the end-user.

3.4 Management Stance on Information Technology

MM: **At past HBS summits, you spoke about the enduring concept of business, which is leaders that make a difference, leaders that make a decent profit, and the globally interlinked world. How do the IS assets of people, process, and platforms advance those concepts?**

WM: You picked up on the original mission statement of the HBS. Our original mission was to educate leaders to make a decent profit decently. It’s, of course, quite different from what we went through in the 1980s because it’s a decent, not maximum, profit. That word “decently” is what basically made the MBA stick at our university. It addresses much more than the trade school mechanics. It includes items such as ethics, fitting in with government policy, all the things behind “decently” that are so absolutely critical now and worthy of university research attention.

We have a new statement, which is, “We educate leaders who make a difference in the world” (Harvard Business School, 2018b). You simply can’t run an organization today without a deep impact from IT. IT suffuses almost every element of the value chain. It cuts across industry borders and brings alliances between formerly different kinds of businesses — an experience felt when companies are acquired. IT facilitates bringing the businesses together so they can operate as one.

The challenges of business have become ever more important. More and more are in the strategic quadrant of a grid that I put together in the early 1980s (McFarlan, McKenney, & Pyburn, 1983). With each generation, more and more organizations fundamentally transform operations with technology. HBS is absolutely no exception. It has 120 IT people to keep its basic operations running, which includes all kinds of experimentation and the rollout of technology to enable on-line learning — experiments as the school figures out exactly how its products and processes are going to change its education and research delivery.

Where IT came to prominence in the 1960s was in organizations that had lots of paper to handle like insurance companies and banks. Also, IT heavily impacted the oil industry in terms of reservoir simulation models, and American Airlines, which pioneered the reservation system with IBM and American trying to wrap their hands around large amounts of data. However, for the vast majority of people using IT, they were automating with IT and weren't really turning their operations inside out. The reason I picked the book *Corporate Information Systems Management* (Cash et al., 1988) as one of my favorite works was because early in the 1980s it became clear that there was a whole series of organizations using technology to really differentiate, control channels, and move forward to where IT lay at an intersect with corporate strategy.

A pair of articles in 1984 and 1985 highlights this. The first was written by me called "Information Technology Changes the Way You Compete" (McFarlan, 1984). The article basically drove technology up from the domain of IT implementation management to the very top of the company. Mike Porter (1985) then had an article about eight months later that also addressed the movement of technology into the top ranks of the company. Suddenly, IT was being suffused into all aspects of the organization. And if IT wasn't, you were losing customers and not being cost-competitive. That was the time when we created our required MIS course, although we had elective MIS courses since about 1962.

MM: As a result of these different IT capabilities, IT departments have more C-level positions than any other department. Is it necessary to have all these C titles because of the complexity of IT, or are we just complicating the discipline with yet another set of acronyms?

WM: We have a number of functions in IT, and if it makes people comfortable to be called C-something that's fine. We could have organized marketing that way or production operations. Another question about roles in an organization—which is a really hard question—is what is it that you do in-house and what is it that you push outside? And how do you manage each?

I watched my youngest daughter, 41, a vice president at a large manufacturer, take big pieces of their operating processes and turn them over to an Indian company. They tried to manage the conversion to outsourcing by putting various controls and performance metrics in place.

Outsourcing may be more cost-effective, but it creates a whole new set of management complexities and roles. In an earlier phase of my life, I thought that outsourcing routine processes would be less managerially complex. It's very clear that companies can arbitrage some labor cost differences. However, the problems with coordinating, not being able to innovate, and becoming inflexible pose more complicated risks today than we had anticipated.

MM: IT people who manage outsourcing talk about infrastructure as a service (IaaS) and software as a service (SaaS). Is it really business process as a service (BPaaS) that brings value to organizations?

WM: Yes, it's defining a process and then determining how you can deliver the process in the most adaptable, cost-effective way. Then you have to look at managing geographically. For example, Levi Strauss has a European operation center which has to be coordinated with Mumbai as well as their San Francisco headquarters, which complicates outsourcing.

MM: When I think of a company that has done a good job with BPaaS, before the acronyms became modern, it is ADP (Automatic Data Processing). Is there another company that comes to mind that has done a good job at taking on the outsourcing process?

WM: Yes. ADP has been a formidable performer in that field because it was able to come out of basic payroll processing and really focus on the total payroll solutions. The much more messy outsourcing processes are the ones that companies like IBM, CSC (Computer Sciences Corporation), and the old EDS (Electronic Data Systems), among others, took on. Essentially, IBM,

CSC, and EDS took over a company's IT operations and tried to operate them as the company did, only more efficiently. Over time, then they would re-engineer the processes for additional efficiencies and cost savings.

The ADP processes were a more promising approach to outsourcing, but, of course, in order to use ADP the company has to accept ADP's systems and controls. That is to say, integrate all the ADP outsourcing changes in-house and adjust immediately to the turbulence of change, which has been part of the field of outsourcing for the last 50 years. As a result of this change challenge, I often say that IT is a field of applied human psychology as much as it is a field of technology.

3.5 Management of Information Technology Projects

MM: When looking inside the IT department there are a lot of digital projects coming for companies. Think about your book *Connecting the Dots* (Benko & McFarlan, 2003) and managing in unpredictable times. Where are all the resources for these products going to come from?

WM: The resources are going to come from the cash flows of the companies, and if companies don't do the projects they don't get to live; really, that's the hard thing. The book *Connecting the Dots* (Benko & McFarlan, 2003) at its core talks about a portfolio of work and that different aspects of the portfolio have different elements of risk. The book flows directly out of a paper that I published in 1981 called the "Portfolio Approach to Information Systems" (McFarlan, 1981) — a paper that was actually based on the work that got me promoted to tenure at Harvard in the first place.

The answer to your question is, if a company doesn't invest and it keeps saying "no" it will begin to lose capability and run behind — suddenly it isn't able to compete. The interesting problem today is, we do a whole lot less bricks-and-mortar-type projects and a whole lot more IT projects, as we've moved from one environment to another.

MM: As a business society, how has managing a portfolio for projects changed?

WM: So much of everything we do today is software, with all of its issues around security, privacy, and so forth. It is the kind of work that Andy McAfee and Erik Brynjolfsson put together for adopting change (McAfee & Brynjolfsson, 2008)³. The capital investment dollar is going much more into information-technology-related initiatives. The work portfolio had a different set of project characteristics 40 years ago than it has now.

MM: When I think of a field that has a tremendous amount of experience in project management, it is the construction industry. Do you think there is a transition for people who have project management experience in construction that can flow into software?

WM: I think the answer is yes, provided that they are able to internalize what the risks are of a software project versus a construction project. The stress points of a project team in a construction project are different from the stress point indicators in a software project.

MM: Seeing that technology has become vital to most corporate strategy initiatives for mature companies as well as start-ups, is portfolio management more important than ever to companies?

WM: Yes, it's the notion of thinking about a portfolio of projects and understanding which projects have a lot of risk and which ones are straightforward. That is key. You have to know how to tradeoff between risk and speed, and how the software pieces build on one another. With all of that in mind, it makes portfolio management a more interesting problem today. Critical, too, is managing the new fields of applications that are developing. Examples include fields like artificial intelligence and self-driving cars.

MM: IT leaders regularly transition their portfolio management to deliverers of service projects versus builders of original IT solutions. How does one best manage the space between being a deliverer and a builder to create competitive advantage?

³ The speed at which new companies can spin up operations and their per-employee spending on technology are among the investments that make a positive difference in their internal processes and external competitiveness.

WM: That's a hard management task. It has a lot to do with your imagination and ability to conceive what needs to be done in an organization — reaching across organizational functions. As time and distance collapse it can provide an opportunity to rethink something in an entirely different way by decomposing all the components in a process. Uber does this. I'm the customer and it's my handheld device with an app that floats across any telecommunication system using my GPS. Over on the other side, the Uber driver reaches through that same network to decide which of the requests he or she wants to act on. Then a complete mapping function ties my location to the driver's location until the service is complete. That is to say, layers of different technologies are conceived as one and then woven together.

MM: **Software is transformational to applications like artificial intelligence and self-driving cars, and this has heightened the awareness of software quality. We read it in the newspapers almost every day now. Are new techniques needed for managing standards and controls versus a fast response to software development projects?**

WM: Yes, of course, because the penalties for mistakes are so much higher. For example, with self-driving cars, how do you avoid accidents, deal with uneven roadways? There is a whole set of detailed program requirements. That one-in-a-thousand accident could happen 40 times a day inside a specific city if you don't have quality programming in the system.

3.6 Work on For-profit and Nonprofit Boards

MM: **You talked a good deal about the book *Joining a Nonprofit Board* (Epstein & McFarlan, 2011), and indicated that IT professionals want to grow their careers by getting on a board. Do you think that starting off on a nonprofit board is the best method, and then moving to a for-profit board?**

WM: I think it's an interesting approach. The HBR article that I wrote with Dick Nolan in 2005, "IT and the Board of Directors" (Nolan & McFarlan, 2005), touches on this question. The issue is that there's a whole group of companies where technology policy issues need to be brought to the most senior levels of the company. However, the greater problem is finding a person in IT who speaks the language of the board. That's the problem. Boards are worried about, among other things, CEO succession and product portfolio. The challenge that IT people have is picking up enough experience along the way so they can participate in those business discussions as well as technology discussions. The nonprofit boards create one way of developing an understanding of those issues. Opportunities to serve on the boards of smaller technology companies that are not seen as a direct competitor to a member's organization is another way to get that experience.

My life has been split between for-profit boards, which I've served on for 25-plus years, and nonprofit boards. I've seen the differences between the two board environments. I was appointed to for-profit boards because of my comfort with technology and my ability to relate to the very senior-most issues. I chaired the Harvard Advanced Management Program (Harvard Business School, 2018c) for a period of time as well as being head of Executive Education (Harvard Business School, 2018d). Therefore, my work included dealings with senior executives and learning the language they communicate in. There is a style and a language of senior executives. The challenge for the IT person is a perceived narrowness and desire to stay in the comfort of the technical. IT professionals understand the technology but may not quite have the fluidity to deal with these other business topics. That's why either a nonprofit board or a smaller technology for-profit board may be a way for them to get started.

MM: **Will you walk us through what a board looks like without an IT executive versus a board with an IT executive?**

WM: In terms of how it functions, I think that a board without an IT executive comes up with a series of policies to address technology that can be out of tune with changing reality, or what others are doing in the industry. If the board has an IT executive, he or she has to be somebody who aligns intellectually with the business, and is nimble, and thinking on the leading edge of emerging technology. It can't be somebody caught five years in the past. The person of the past basically acts as a drag and unfortunately helps people miss what's going on with technology.

MM: If the CIO's role in the organization is not just about technology, can you share an example of the amount of influence an IT executive might have to leverage technology versus a CIO who just has technology knowledge?

WM: If the CIO doesn't understand the business, marketing, people, and the value proposition, then he or she may not be able to relate to what's going on in the business. Unfortunately, it is more incumbent on the CIO to develop that knowledge than it is for the rest of the organization to learn to master technology. My friends who are successful CIOs, if you listen to them you wouldn't immediately understand that they came from a CIO background. They simply know the language of business, the competition, the business, the value proposition, and so forth. Because of their IT background they understand where and how technology can make an impact.

MM: Surely, boards do not err in their decisions about making technology work. If an IT executive is not present on the board, how do boards cope with the challenges of technology?

WM: Well, they have to outsource the role. They simply need to know when they're in a black hole of knowledge and bring in a software organization, an outsourcing organization, or a consulting firm that can work on the area where the board lacks IT knowledge. The board member seen as most knowledgeable in the area of need is likely to be the sponsor of the effort.

3.7 View on China and Information Systems

MM: Over 50 years you go from the incubation of MIS to China leading. How do you personally think about integrating technology and China?

WM: It's really interesting. For example, the world saw the Alibaba IPO a few years ago; however, years before that I wrote a case study on Alibaba in 2000, just 10 months after the company was launched (McFarlan, Knoop, & Lane, 2000). At that time, they didn't know whether they were a service company or an internet company. This was a study we did with Tsinghua University and Harvard in Beijing. I was scared to death that the company was going to go bankrupt before the first executive seminar took place. It's not much fun teaching a case on a company that has just gone under.

What has become extremely interesting — and resulted in an article I did for MISQE a couple of years ago (McFarlan, Jia, & Wong, 2012) — is the differences in the technology industry between China and India. It turns out that China is much more information-intensive than people had thought. Most people thought that India was information-technology-intensive. However, when you understand what's been done and over what time span it's been done, China has made IT a matter of national priority. I was able to see this from a very clear perspective because, again, when I retired from Harvard in 2009 I took a position as co-director of the case center at Tsinghua University, which is in the School of Economics Management. Tsinghua is the number one university in China; it is the MIT of China. A lot of the cases are on technology service companies, companies that we previously had no access to.

MM: Would you describe a few of the technology industry differences between China and India?

WM: It starts with the quality of technology architecture and infrastructure that China invested in right from the beginning on land lines, mobile towers and so forth. Whereas India was great in technology skills, they had trouble developing inside their own country. So, they sold their skills across networks to the rest of the world. China has a very strong internal infrastructure; one of the nine priorities its national government is working on is the growth of the IT industry (Ban & Hou, 2017). India doesn't have that focus and thus organizes itself in a quite different way. India's advantage was fluency in the English language and it was able to start with call-center outsourcing. Then India moved into technology outsourcing. At times it may be hard working through an Indian telecommunication system, but it's doable, whereas it's impossible to interact inside China unless you're fully fluent in Chinese.

MM: What would you say are exemplar lessons found on how China has made IT a national priority?

WM: The national priority was a focus straight out of the politburo and its establishment as one of nine key strategic emerging industries (Ban & Hou, 2017; Xinhua Finance Agency, 2017). With technology as a national priority, that ruthlessly changed the competitive landscape in China.

Google was driven out, Facebook wasn't allowed, and they basically built space for the indigenous companies to grow. And these indigenous companies are now really large because the population is huge. That was a central government decision to grow technology from within the entire country and to do it over dial tone to every single resident, no matter where he or she lived.

MM: **What does the business world not fully appreciate about China's ability and influence with technology?**

WM: First, China is a closed system. You cannot make it as a foreign company unless the government wants you. Second, information is control and power inside China. And the role of the state is there, every step along the way, governing what you can and cannot do. These state controls of dos and don'ts just don't exist in either Europe or the United States.

MM: **How would you characterize some of the technology issues that need to be addressed when dealing with China?**

WM: It's basically national political relations. For example, it's addressing security, software piracy, the protection of intellectual property when doing business in China. Those are the areas where China has really pushed in hard, and inappropriately so, around the edges.

4 The Second Interview

During the second interview, I asked McFarlan to consider each theme's content and to offer a reflection on the narrative that develop from our first interview, which I detail in this section.

4.1 Development of Information Systems Courses at Harvard Business School

MM: **Reflecting on the development of information systems courses at Harvard, we see a rich context around suffusing technology throughout the different departments, in addition to bringing in quest speakers, and also just talking about how different universities need to build their curriculum based on the type of student they have. What are your thoughts as you reflect on the theme that developed?**

WM: Probably the biggest initiative that we have underway with our faculty and students right now is our digital initiative. It involves almost half of the faculty, including most of the marketing, most of the operations management faculty, a good piece of the leadership faculty, and so forth. We bring in a regular series of speakers, encourage the faculty to do executive programs on the topic, in-case writing, and so forth. In a really interesting way, all departments are included instead of pushing the digital initiative into a course just for MIS students. It's really a central activity.

For example, if you look at our marketing curriculum you'll see there's a course on marketing in the digital age. These are marketing professors, but they basically develop cases on Uber and a whole variety of other marketing applications about digital technology. It really is a sweep across the entire course portfolio of the school. The impact of technology is really quite interesting. I was looking this morning to see how my investment portfolio is being managed, and of the top 20 stocks I have, 10 are technology companies. So it's Alphabet, Facebook, and Alibaba — companies that are more competitive than ones like Boeing and so forth.

MM: **This speaks to the whole context of this theme on how technology is suffused across departments and it's something that has happened and is continuing to happen at HBS.**

WM: Sit back and look at the 15 or 20 largest companies in the United States and they are companies at the heart of delivering different pieces of digital information in the revolution. You know Amazon, PayPal, and the others that I just mentioned — it's a big piece of the economy. For example, I read something the other day on digital ads in the United States, and 73% of them are sold and displayed through Google and Facebook.

What makes it complicated is that companies need to get the digital technology projects and processes in place and that's where you need IT people. The fact is, the functional areas and structure of organizations have just been absolutely transformed by technologies.

4.2 Redefining the Digital Native

MM: On the theme of digital natives you provided insight on how we transition through the changes in what defines a digital native. Would you now reflect on this theme?

WM: I think that the information technology industry is a brutal field to grow old in and that the challenge of relevance is continual harsh reinvention. And sometimes you just haven't got the capacity. I remember our first big investments in internet technology when we were building out our internet school. We had a department of about 50 people; they were all organized around processes to do things in a certain linear kind of way. For the transition we designed a skill test that took about 10 minutes to take, and if you could answer the 15 questions you were going to make it in the new environment. All but one person failed the test. Their minds were thinking one way, whereas the internet was simply calling for people to think about problems in a different way. It was a really hard time. People that had been very valuable in a previous time simply weren't "continuously curious" or they didn't understand their restrictive thinking when it came to the internet.

MM: When you talk about the industry being brutal, how would you describe brutal as it relates to IT?

WM: Brutal is basically when cutting-edge skills at one time become a commodity and then irrelevant. If you aren't continually mastering and trying to think about how things are done in a different way, experimenting, and being retrained, you're suddenly out of the game. And you don't always understand when it happens because there is a certain amount of the old work to be done. People are maintaining and patching legacy code for legacy systems while the systems are slowly becoming obsolesced. The final part of getting rid of the legacy system is getting rid of the legacy code writers.

4.3 Language of Business Versus Language of Information Technology

MM: In a reflection of language, you explained that an IT executive has to keep up with the modern-day nouns to describe business and technology change, he or she has to have a "command presence," be able to frame change in business and technology terms and have transparent communication. How would you close on these thoughts?

WM: You have to have the ability to re-imagine. I've been using Uber a lot and it's just fascinating to think that if you were the head of a taxi cab company's IT department 10 years ago, would you have ever been able to visualize something like Uber or Lyft? These companies now offer a compelling set of services that simply sweeps your whole product line into oblivion. The stuff you've used in terms of performance measurements, technology, and so forth for taxi cabs have simply disappeared. Suddenly the whole way the industry operates and communicates is transformed.

4.4 Management Stance on Information Technology

MM: The discussion around the management stance of information technology was a nice progression starting in the '60s with trying to organize paper and handle the massiveness of paper processing systems. Then, automating processes such as American Airlines' development of a reservation system and their need for managing data. In the '80s information started changing the way companies compete. Then the IS discipline got complicated and many C-level roles were created. Not the least is the complexities of outsourcing systems and processes, and the changes that come from cloud computing. How would you tie these thoughts together?

WM: There exists a vastly bigger set of technical skills than anyone has had to put together information architecture today than existed 20 years ago. Although there were issues, it was a simpler time. We've taken today's complexities and parsed them into specialties. And that's really where it became more complicated for one person to manage all the specialties. That's where outsourcing begins to change the need for technology management skills and contract management skills.

4.5 Management of Information Technology Projects

MM: We see that for the management of IT projects, now more than ever a portfolio of projects contains different levels of risk and that if a company does not invest in projects it will not

be able to compete. In addition, investments in IT continue to grow regardless of whether an organization's IT department is a deliverer of services or builder of original IT solutions. What are your closing reflections on the management of IT projects?

WM: Portfolio management has become a more senior-level activity over time. I wouldn't have worried as much about the portfolio and the business risk of projects 20 years ago as I do right now. Running a company today is so competitive and competitive advantage is so ephemeral. Portfolio management really becomes part of the overall management process. I don't think we thought it was going to be that way when it started.

For example, depending on the organization project portfolio management may basically flow out of the board, the CEO, and the chief technology officer. For example, the strategy on how Yelp developed itself comes right from the top. The strategy of Lyft and Uber, that comes again right from the top of the organization. That means the CEO has a fluent understanding of the areas of IT.

4.6 Work on For-profit and Nonprofit Boards

MM: When you think about for-profit and nonprofit boards and IT executives being on them, is there a closing reflection that you might add?

WM: In an ever more information-mediated world there needs to be an understanding of how technology is really transforming your product, your sales process, and so forth. For example, the Boeing 787 is the most incredible collection of information technologies in the basic production. The entire airplane is designed with software and IT based on decisions from the very top of the organization. The IT and technology leadership extend to the very top of the organization because if something is wrong, the plane doesn't fly.

My colleague Dick Nolan spent a long time studying Boeing and he talks about the problems it had when the company basically broke the expertise link by not having technology executives in the boardroom. This broken link led to a three-year slippage on the production of the 787, which nearly cost the company everything as they learned how to recover.

4.7 View on China and Information Systems

MM: From the time you did your first case on Alibaba you have seen a lot of change in the technology from China. How would you reflect on all that change?

WM: What's clear is that China came from a position back in the pack in technology to front and center. They benefited much more than I had originally thought they were going to by having a closed market. And they have a lot of strong technology universities, so they are able to develop a skill base — a skill base that doesn't have to worry about foreign competition. They simply had to figure out how to get things up and running in their own environment. Also, they have had a very relaxed attitude about intellectual property and privacy.

5 A Final Comment

MM: As an esteemed scholar you have graciously spent countless hours and intellect being interviewed. What is that one question that you have longed to answer but have yet to be asked?

WM: The question never asked of me is how nonprofit work became a part of my life. And I would say that it is really based on my driving interests. For my first appointment I was asked to join a local school board. I worried that this new appointment was going to distract me from my work at Harvard. It turns out that, at the time, our dean was chairman of the board at one of our largest nonprofit hospitals and set a wonderful role model for engagement in this type of activity.

We conducted a study and discovered that 80% of our alumni were involved in a social enterprise and over a third of them were currently serving on a nonprofit board. The discovery humanized, softened, and gave me a different perspective about for-profit work. We now have eight social enterprise professors at HBS. Additionally, my teaching assignment in Executive Education is on nonprofit board governance. As a result, I teach in our major program of 100-plus CEOs through the insights I received from IT and my 35 years of working on nonprofit boards.

Finding your passion is very important. I explain, repeatedly, to my junior colleagues that you do your best work when you are able to find the things that you're really interested in. The notion of passion is quite important. Very often our passion leads us in surprising ways to things that fit our other areas of interest.

References

- Abrami, R. M., Kirby, W. C., & McFarlan, F. W. (2014). *Can China lead? Reaching the limits of power and growth*. Boston, MA: Harvard Business Review Press.
- Ban, V., & Hou, T. (2017). China names latest “strategic emerging industries”. *Global Policy Watch*. Retrieved from <https://www.globalpolicywatch.com/2017/03/china-names-latest-strategic-emerging-industries/>
- Benko, C., & McFarlan, F. W. (2003). *Connecting the dots: Aligning projects with objectives in unpredictable times*. Boston, MA: Harvard Business School Press.
- Cash, J. I., McKenney, J. L., & McFarlan, F. W. (1988). *Corporate information systems management: The issues facing senior executives* (2nd ed.). New York, NY: McGraw-Hill, Inc.
- Dearden, J., & McFarlan, F. W. (1966). *Management information systems: Text and cases*. Homewood, IL: RD Irwin.
- Epstein, M. J., & McFarlan, F. W. (2011). *Joining a nonprofit board: What you need to know*. San Francisco, CA: Jossey-Bass.
- Harvard Business School (2018a). *Initiatives; Critical mass and critical thinking around critically important topics*. Retrieved from <https://www.hbs.edu/about/initiatives/Pages/default.aspx>
- Harvard Business School (2018b). *Our mission: We educate leaders who make a difference in the world*. Retrieved from <https://www.hbs.edu/about/Pages/mission.aspx>
- Harvard Business School (2018c). *Advance management program: Transforming proven leaders into global executives*. Retrieved from <https://www.exed.hbs.edu/programs/amp/Pages/default.aspx>
- Harvard Business School (2018d). *Executive education*. Retrieved from <https://www.exed.hbs.edu/Pages/default.aspx>
- McAfee, A., & Brynjolfsson, E. (2008). Investing in the IT that makes a competitive difference. *Harvard Business Review*, 86(7/8), 98.
- McFarlan, F. W. (1981). Portfolio approach to information systems. *Harvard Business Review*, 59(5), 142-150.
- McFarlan, F. W. (1984). Information technology changes the way you compete. *Harvard Business Review*, 62(3), 98-103.
- McFarlan, F. W., Jia, N., & Wong, J. (2012). China's growing IT services and software industry: Challenges and implications. *MIS Quarterly Executive*, 11(1), 1-9.
- McFarlan, F. W., Knoop, C.-I., & Lane, D. (2000). *Alibaba.com* (Harvard Business School Case 301-047). *Harvard Business School Faculty & Research*.
- McFarlan, F. W., McKenney, J. L., & Pyburn, P. (1983). The information archipelago: Plotting a course. *Harvard Business Review*, 61(1), 145-156.
- Nolan, R., & McFarlan, F. W. (2005). Information technology and the board of directors. *Harvard Business Review*, 83(10), 96-106.
- Overman, G. D. (1966). Harmony life of Hartford. In J. Deardon & W. McFarlan (Eds.), *Management information systems: Text and cases* (pp. 321-334). Homewood, IL: RD Irwin.
- Porter, M. E. (1985). Technology and competitive advantage. *Journal of Business Strategy*, 5(3), 60-78.
- stevieboy247. [Screen name]. (2009). *CBS Evening News West Coast Edition—Walter Cronkite's last day (3/6/1981) (part 5 of 5)* [Video file]. Retrieved from <https://www.youtube.com/watch?v=H9QEUfkRkZ0>
- Xinhua Finance Agency. (2017). *China increases policy support for strategic emerging industries*. Retrieved from http://en.xfafinance.com/html/Dont_Miss/2017/346678.shtml
- Zhang, P. (2015). The IS history initiative: Looking forward by looking back. *Communications of the Association for Information Systems* 36, 477-514.

About the Authors

Michael Milovich Jr. is Assistant Professor of Management Information Systems at Rowan University. He has co-authored multiple conference papers and written for *MIS Quarterly Executive*. Additionally, he has been an ad hoc reviewer for *The Journal of Strategic Information Systems*, the *Communications of the Association for Information Systems*, *MIS Quarterly Executive*, and for many of the IS discipline's conferences (ICIS, AMCIS, HICSS). He has more than 30 years of technology experience in both small and large companies. His work has been performance-focused in the areas of IT vision, convergent strategy, and tactical foresight as a business champion. He has leadership expertise in cost controls, developing and managing teams, recruiting and retaining key reports, worldwide integrated IT solutions, and process improvements. His experience is in operations and back-office technology roles. In addition to consulting, he is a former vice president of IT for a Fortune 500 company, where he was responsible for the integration of the company's global data center. His community service work includes the role of former city council president in a suburb of Columbus, Ohio.

Copyright © 2019 by the Association for Information Systems. Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and full citation on the first page. Copyright for components of this work owned by others than the Association for Information Systems must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists requires prior specific permission and/or fee. Request permission to publish from: AIS Administrative Office, P.O. Box 2712 Atlanta, GA, 30301-2712 Attn: Reprints or via e-mail from publications@aisnet.org.