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A New Day for Technology

We really wish that the old adage "If it ain't broke, don't fix it" applied to attempts to introduce new technology. That would make life a lot easier. Unfortunately, identifying what is broken and how best to fix it isn't always an easy process when faced with the competing pressures to improve performance before slipping into mediocrity. Technology, however construed, is intrinsic to the functioning of human enterprise—universities, business organizations, governments – though we often become enamored of the next new feature rather than the solidly simple solution to the human endeavor.

Technology, especially information technology, has advanced significantly and at a seemingly increased pace in recent decades. The recent turn of the century, occurring during a moment of self-congratulatory *technophilia*, drew observers to see parallels to the Age of Invention that occurred at the dawn of the 20th century. Notwithstanding the progress of the past two decades in computing and communications, one wonders whether the advances could have been even more significant—or to put this another way: were the advances in the *exploitation* of technology achieved at a higher cost than necessary? And was the exploitation of technology all that it could or should have been?

One thoughtful contemporary observer, Al Erisman, Director of the Institute for Business, Technology, and Ethics and the former Director of Mathematics and Computer Technology for the Boeing Company, has elaborated on reasons why IT projects fail[1]. In the context of technology adoption, three of the reasons he provides are especially worth noting: 1) sometimes the idea embodied in the project is really a bad idea, 2) sometimes the complexity is too much for the organization to manage, and 3) organizations have immune systems that activate to reject a change or a new idea.

In his argument, Erisman cites the Standish Report[2] that surveyed more than 8,000 IT projects globally and documented a failure rate of 60 – 75%. How can this be and who is to blame? In fact, it would seem that blame could be distributed to all of the players in a typical technology transaction:

- Enterprise clients succumb to inter-departmental rivalries that diminish the prospect of serving the needs of users of the technology within the enterprise
- Technology vendors routinely over-promise just to get 'the sale'
- Systems integrators behave as uninspired order fillers without helping the client discover how a technology serves what the true business needs are.

To adopt Erisman's perspective and join it to our own, we propose that some ideas are bad ideas because they are unrealistic in terms of how organizations operate or how human beings behave. As potential illustration of this, consider the Apple *Lisa* personal computer that was introduced to the corporate market in 1983 with an innovative graphical user interface, but did not include any networking functionality to address the communication needs in business enterprises. The *Lisa* failed because it was an unrealistic application for the business market at the time.

Closely associated with the bad idea is the change that an organization would have to execute in order for a new technology to be successful. Such organizational change is often so complex that it requires more management than its sponsors might have imagined. For example, about 10 years ago a large prestigious investment banking firm sought assistance to evaluate several competing proposals to introduce laptops to the investment bankers of the firm. After carefully studying how the bankers conducted their work and, specifically, how they relied upon their phones, the firm made a stunning decision. Rather than adopt a new IT platform that would require the bankers to learn to use a new tool and to modify how they got their work done, the firm chose to delay acquiring the IT platform. Instead,

[1] cf. *Ideas for Avoiding Large-Scale Information Systems Failures*, *Ethix*, January-February 2003, www.ethix.org
[2] cf. The Standish Group Report, *Chaos*, 10 October 2000, www.standishgroup.com

the IT department decided that the productivity of the bankers could be enhanced quickly by giving them a modicum of instruction on how to use their phones better.

The corporate immune system that Erisman attributes to any organization subjected to a new idea is analogous to the reaction of the human body to the introduction of a foreign body. That is, the human body cannot distinguish between a healthy transplanted organ and a micro-organism attacking the bone marrow, for example. In either case, the body naturally acts to reject the foreign organism. Examples of organizations naturally springing into action to reject any new idea are legion. Anyone needing convincing that this is the organizational norm should just record in the next meeting how many reasons are offered for why a proposed idea won't work.

In any case, the unwitting technology adopter may experience a decline in the quality of the status quo. A parallel discussion that persists is the so-called 'Productivity Paradox". Erik Brynjolfsson, a professor at MIT, has expounded eloquently on this issue[3], and we would support his position. Innovation typically requires some disruption of conventional ways of doing things. This is not necessarily undesirable, but it does have to be managed. Such innovations as a new technology that promises enhanced productivity, increased efficiency, or rewarding new activities will challenge both its sponsors and its adopters to understand the consequences of its deployment. The core issue is: ***How can technology sponsors and adopters prepare for the consequences before committing to the deployment?*** We have a suggestion – a strong recommendation – to use technology in a particular way to sell and adopt technology.

The Experience Laboratory Concept

Imagine that one could create a laboratory environment where prospective users of a new information technology, along with the technology vendor and those who would be responsible for the deployment of the technology, could conduct experiments on the technology. To be fair, IT departments of most enterprises do conduct experiments on most technologies before a final decision to buy the technology is made. These experiments –or tests—however, tend to focus on the reliability of the technology. They address the question: does the technology really perform as the vendor purports? This is an important question, and one would hope that the IT department would find convincing positive answers before the "buy" decision is made. This is, indeed, a necessary question, but it is not the sufficient question that really needs positive answers before an enterprise can consider deployment.

The sufficient question also addresses the real usability of the technology for the relevant employees in the trenches. Will they use the technology in ways that are constructive for the enterprise? One might ask whether it is possible to get answers to this question before deploying the technology. In fact, it is common for an enterprise, recognizing the importance of the question, to commit to a pilot of the technology in the enterprise environment. As attractive as this approach might seem — and it may be necessary — it has two significant drawbacks. First, a pilot cannot be conducted easily as a controlled experiment. Hence, the outcomes of the pilot may be attributed to exceptional or interfering events – sometimes favoring and other times discrediting the technology. Bottom line: it is hard to get to the real answers to whether the technology is "right" for the enterprise or, more pragmatically, what needs to be done to assure that the technology is "right" for the enterprise. Second, the time and money expended on a pilot are typically significant for the enterprise and require some sense of commitment to buy. What the enterprise needs is a quick and affordable laboratory to evaluate the technology ***and*** the way the enterprise could respond to the technology.

[3] cf. Brynjolfsson, E. and Hitt, L.. Beyond Computation: Information Technology, Organizational Transformation and Business Performance, *Journal of Economic Perspectives*, Fall, 2000; Brynjolfsson, E. and Hitt, L.. Beyond the Productivity Paradox, *Communications of the ACM*, August, (1998)

The laboratory components

The laboratory concept we have in mind is what we call an "Experience Laboratory". It does not require construction of a special facility so much as a commitment to doing something with discipline. Like any other laboratory, the Experience Laboratory has four key elements: 1) context, 2) experiment, 3) observation and measurement, and 4) inference. We assemble a laboratory team that designs the laboratory by building the context and the experiment to accompany it. The laboratory team also delivers the laboratory, which entails coaching, careful observation, and debriefing.

Context. The purpose of information technology is to assist data-driven decision-making in the enterprise. Decision-makers in the enterprise must learn how to use information technology to help them make better decisions (i.e. producing desired outcomes) and to make decisions better (i.e. using rational procedures and methodologies). The data-driven decision-making learning curve is steep, especially when the new information technology tool makes habitual behaviors and gut reactions obsolete.

We know from recent advances in brain science that humans learn best in context[4]. Thus, the context that is most appropriate for testing a new information technology is one that reflects what the user naturally experiences in the real enterprise. Such a context can be created by simulation. Dozens of computer simulations now in wide circulation credibly depict enterprise environments subject to market responses. For example, StoreWars (by Cubiculum) offers a rich simulation of a consumer goods market that captures the interactions of retailers and consumer products manufacturers. Mercator (by PRISM s.a.) simulates a manufactured goods market environment in which enterprises must coordinate R&D, production, strategic sourcing, and marketing as they compete or collaborate with other enterprises in serving global demand. Janus Strategy Laboratory (by Janus Enterprise International LLC) models a market of communication and information goods and services that spans regions and regulatory regimes, where shares of the enterprises are traded on a centralized stock exchange.

None of these simulation models exactly replicates reality. That is a good thing. Each depicts a rich market and enterprise environment that captures the essential elements of the decision-making challenges facing users in the enterprise. Each applies the design philosophy of creating a context that is "strangely familiar". That is, the simulated context is familiar in that it includes environmental elements and decision-making reflective of what the participant must encounter or experience on the real job. But the engineered context is also strange in that many of the assumptions that one might consciously or unconsciously impose to navigate in the real job environment do not apply in the simulated environment. This challenges the participant to discover what is fundamental in running the enterprise successfully.

The Quasi-Experiment. To conduct an experiment, one must first have a theory or story in mind, and some hypotheses to test or fundamental questions to answer. For example, some relevant hypotheses associated with the problem of introducing new mobilizing technologies into an enterprise might be:

H1: mobile email distributed to people within the enterprise will add net cost to the enterprise
H2: mobile email distributed to people within the enterprise will be quickly adopted, threatening the security of the enterprise data
H3: remote access for people within the enterprise will change the way that people work, eliminating the need for administrative staff (cost savings)

To test these hypotheses in a laboratory setting, it is necessary to define *treatments*. In the Experience Laboratory, suites of technologies act as treatments. For example, one treatment associated with testing H1 and H2 could be the Nokia wireless data transfer platforms. An alternative treatment for H1 and H2 – and one that could be applied to test H3 – might be a light VPN solution from Aventail.

[4] cf. Pinker, *How the Mind Works*, 1999

After the context has been developed, the hypotheses specified, and the treatments defined, subjects who will participate in the laboratory break into control groups (that do not receive treatments) and treatment groups (each receiving specific technology treatments). Both control groups and treatment groups participate in the laboratory by managing simulated enterprises and pursuing specific, well-understood enterprise goals. Alternatively, controls may be initiated on all laboratory participants by applying treatments on groups in a 'before and after' manner.

Observation/measurement. Small teams of participants each manage a simulated enterprise while coaches closely monitor the team activities. The coaches note decision-making styles, both for the individuals and the team as a group, paying special attention to the areas that might be most affected by the different conditions imposed by the laboratory environment. Depending upon the hypotheses under scrutiny, coaches can observe both intra- and inter-team activities and results. In addition to the coaches, the vendors of the relevant technology take part as observers to learn ways to improve their products for such enterprises as those represented by participants in the laboratory. All participants of the laboratory have access to the vendor agents to ask questions and make suggestions. Such access to the vendor for the actual users of the technology does not typically happen at this level in any other venue.

Inference: The laboratory team designs the laboratory and conducts the experiment in the laboratory. As such, laboratory team members draw inferences from what they observe as the laboratory unfolds. A technology pilot may be conducted in an enterprise in anticipation of a technology procurement decision or negotiation. In contrast, the Experience Laboratory uncovers the likely interactions of potential users with the proposed technology. Those inferred interactions are then recorded by a dispassionate, politically unmotivated third-party.

This un-biased observation is a key element of the Experience Laboratory concept. Ample evidence from the field of psychology documents how perceptions are molded by influences[5]. The laboratory team is beholden neither to the user enterprise nor to the technology vendor. What the laboratory team infers from observation of the rich human-technology interaction in the laboratory will be a dispassionate rendering of what the participants experienced.

A device employed by the laboratory delivery team to ground the inferences drawn from the laboratory is a 'bridging session'. That is, as any laboratory is an abstraction from the unstructured organizational reality, participants must be induced to reveal how the experience within the laboratory setting could apply to the realities of the organization that employs them. The bridging sessions scheduled throughout the laboratory are designed to capture such projections. Moreover, as the laboratory entails learning on the part of participants, the results of the bridging sessions typically evolve to provide progressively incisive projections from the laboratory to the real organization.

The Value of the Experience Laboratory in the Eyes of Its Constituencies

The Experience Laboratory produces value to three distinct constituencies that are typical parties to a technology transaction. These constituencies are 1) the enterprise considering adopting a technology, 2) the technology vendors, and 3) the systems integrator.

For the enterprise customer

The Experience Laboratory helps decision-makers evaluate IT solutions in an analogous but natural use environment. The Experience Laboratory does this by creating a context in which participants from the enterprise can attempt to map IT solutions to business needs. Thus, the Experience Laboratory helps senior executives understand in depth, before committing to a specific IT solution, just how those purported IT solutions intended to advance the organization may perturb or disrupt organizational and

[5] cf., for example, Bettman, J.R., 1979, An Information Processing Theory of Consumer Choice, Addison-Wesley; Payne, J.W., Bettman, J.R., and Johnson, E.J., 1993, The Adaptive Decision Maker, Cambridge University Press

business processes. This means that senior management may plan and prepare for the disruption associated with an innovation in the event that they decide to adopt the proposed IT solution. This also means that mapping out an adoption and implementation roadmap before committing major investment to the technology vendor will save the enterprise money, time, and effort commonly experienced to course correct when deploying a new technology.

For the technology vendor

The Experience Laboratory helps technology vendor senior executives and sales staff to understand – via close-at-hand observation of potential clients – how its solution platform maps to the needs and requirements of the enterprise client. This is especially valuable in the majority of cases where the enterprise client cannot easily articulate its own needs and requirements in anticipation of how the organization would respond to the introduction of a new technology. This means that the Experience Laboratory accelerates the sales cycle from months to days and produces more credible client information than conventional sales methods ever can. The Experience Laboratory effectively enlists the enterprise decision-makers and influencers into the sales process. The result of this is a rising probability and value of a sale. Another collateral benefit of the Experience Laboratory as a component of the sales process stems from the increased likelihood for establishing enduring positive relationships with the client enterprise.

For the systems integrator

The Experience Laboratory helps the system integrator client service management – via close-at-hand observation of potential clients – understand how the solution platform maps to the needs and requirements of the enterprise client. Thus, the Experience Laboratory accelerates and deepens the needs analysis that any integration project would necessarily require. Additionally, the Experience Laboratory helps the integrator client-service staff work more closely with the enterprise client decision-makers to map out an adoption and implementation roadmap before the enterprise client commits major investment to the vendor. This enhances the value the integrator delivers to the client enterprise.

Summary

In a fundamental sense, the Experience Laboratory is a concept that draws upon intellectual progress that has yet to be tapped by a community that should already know its value. The Experience Laboratory incorporates learning approaches that almost all members of modern organizations know to be effective. It is a simple concept — almost too simple to be noticed.

Revolutions start with a palpable and widely felt frustration. The frustrations of translating the remarkable qualities of new information and communications technologies into solutions to enterprise problems are palpable and well-documented. Revolutions gain momentum when the frustration can be channeled into a simple concept applied to improving the human condition.

So, here is the Experience Laboratory, a simple concept. Let the revolution begin!