

Technology Impact: A potential catastrophe

Dr Stephen J Pratt,

*The College Swansea University Bay Campus
Swansea U.K. SA1 8EN*

ABSTRACT : Recent pandemic experiences has clearly demonstrated that managerial decisions are often taken on the basis of technological ignorance. Assumptions are made that technology is the panacea for organizational problems and are sufficiently agile to enable corporations to instantly change. What is evident, and should have always been uppermost in all corporate strategic decisions, is that human and physical resource planning is key to success. To ignore the impact that technology can have on human resources is a managerial failing: Success is about ensuring human resource management is at the forefront, not technology. Redressing the focus is key, relying on technology can be perilous. Technological implosion is a potential catastrophe facing organisations that are too focused on the technology without realising the impact or damage caused by insufficient planning.

I. INTRODUCTION

Technology has a major impact in our lives, both commercially and socially. Changes made to the technological infrastructure, or the business processes which try to exploit extant digital platforms, can have a significant impact on employee experience, loyalty and consequential retention. Recovering from any potential workplace turmoil can be impactful from financial, operational efficacy and strategic perspectives. The concept and associated issues of change management are not new, and indeed much has been written on it. What is lacking is the management of technological impact associated with the introduction of new technology or the altering the way we use it. Assumptions are often made on the flexibility that technology offers which ignores the fact that any benefit is dependent on the way we use it. Historically the development of technology is often portrayed as a panacea for a gamut of corporate and individual issues, which it is not.

Although there are many examples of IT systems installations going wrong and failing to deliver any initial benefit the majority of cases where IT has been adopted has been successful. The frustration that dominates discussion often centres around the adaption of extant systems to changing business environments. Once the initial euphoria passes management often fail to successfully manage ongoing effectiveness, resulting in system self-regulation and inevitable technological implosion: i.e. the obsession of using technology whether it is relevant or not. Managerial focus should be the assurance that technological impact is minimized and the technology industry needs to assist in the development of applications that are focused on the user rather than demonstrating the dynamic potential of technology. Simply stated is technology letting us down, or are we blaming it for our corporate and individual inefficiencies in maintaining what was believed to be 'normal' working conditions. Best practice, here, refers to the working-day techniques employed by the individual employees in compliance with designed or adapted organisational processes. So the question is are management ensuring that employees are appropriately supported, both technically and administratively, with the allocated technology and embedded applications when working irrespective of location. A model is presented that assists in highlighting the impact of inadequate analysis and planning when altering the extant business operational environments.

II. EFFECTIVE TECHNOLOGY MANAGEMENT

Invariably the management of the latest technological products and support services are generally approached from a short-term technological perspective that is often driven by the desire to secure immediate commercial benefit. The impact on employees and customers can be detrimental as the complexity of issues associated with managing the technological integration into changing business process environments can be difficult to achieve. Recovery from a badly conceived assessment of the impact of change can be damaging to the culture of the workforce and overall operation of an organisation. The ability of employees to actively contribute to organisational change which is driven by technology is dependent upon effective human resource and business process strategy, not just innovation. Ineffective planning and risk assessment of proposed changes to the environment can be demotivational and destructive. The managerial skill set needs to reflect on the consequences of technological adaptation and more purposeful change and not on the return of investment alone.

Historically the primary focus of many management/business schools is the assurance of being the most effective and efficient as possible given operational constraints. Efficiency being primarily assessed on quantitative assessments, whereas effectiveness being more qualitative. In both cases the approach taken have been predominantly mechanistic which has more recently raised concerns regarding the value of MBAs (Pfeffer(2002), Donaldson (2002) and Ghoshal(2005)), in particular the failings of such programmes to avert the corporate disasters of the early 2000s(Podolny(2009), Mintzberg(2004). Mintzberg(2004) and Cappelli(2020) identified the importance of more emotional intelligence (sometimes referred to as ‘art’) to be included in developmental material to assist in enabling the requisite leadership skills. In many ways the technological explosion of the last two decades has not helped as the plethora of information offered has, in many ways, been to the detriment of the evolution of qualitative assessment (Pralhad(1999)).

III. MANAGEMENT OF BUSINESS PROCESSES

In addressing the fundamental question of whether management pedagogy should include both scientific and artistic elements one needs to consider a third to the troika of managerial skills: Technology Impact (TI). Adapting the teachings to address the more creative aspects for current working environments (Salunhe(2018)) needs further expansion to address TI. Technological perspectives are almost entirely focused on the need for agile, quick solutions that effectively respond to the needs of an impatient, technological savvy, consumer base rather than the business process. It is postulated, therefore, that there is a requirement to develop and nurture flair and creativity in the workplace if they are to capitalise on the acquired talent and technological resources (Mello(2015)). This in turn commands a non-prescriptive approach as the quality of the business decisions made is dependent on the quality of investigation undertaken, which in turns depends on the quality of information acquired. The successful management of the use of technology in an organisation extends beyond the development and deployment of applications to the assurance of successful embodiment within organisational business processes. It is no longer acceptable to employ complex technology without assessing the risks to the symbiotic relationship between employee, IT and business processes. TI needs to address the risks associated with change, whether that is changing the infrastructure or the business process, the impact of overall efficiency and effectiveness on the organisation and employees needs to be considered.

The management of TI is necessary to ensure that change, planned or imposed, does not adversely affect strategy so preparation for change is key both in terms of ensuring the accessibility to the relevant skills available in the market or extant employee retraining. The symbiotic relationship between employee, business processes and technology has to be maintained at all times.

“What a catastrophe”! : In an attempt to describe this anomaly of performance degradation in the workplace using advanced IT, it is worth turning to, somewhat ironically, catastrophe theory. The successful growth of application of technology in any organisation is dependent on the recruitment and retention of talent which is often focused on the initial installation and operation of the acquired technology that is applied to extant business processes. However any changes in the working system whether it is due to human resource or operational business processes can significantly impact performance, even to the point of regression to a state prior to the initial implementation.

The disruption resulting from the mis-management of human resources or the adherence to business processes that are not agile enough for any imposed organisational change can have a catastrophic effect on a corporation’s medium and long term strategy. The impact of technology on an individual’s working environment is often overlooked, resulting in stress, demotivation and disillusionment with the organisation culminating in high staff turnover. This being particularly pertinent in today’s post-pandemic corporate world where quick solutions relied on the technological infrastructure being available, rather than assessing the suitability from a of holistic perspective of the enforced working environment. Postle(1980) seems quite relevant here in identifying the factors that can cause psychological stress, which in turn have a major impact on the quality of life: i.e. catastrophe theory. This work, along with Poston(1998) which built on Thom(1989), considers the effect of continuous actions and factors in producing a discontinuous, significant shift in operation, and as such is viewed as being part of chaos theory. Catastrophe theory provides a mechanism by which systems displaying abrupt discontinuous change can be analysed. Within that context it is considered a mechanism to describe management’s inability to cope with the constantly changing environment and the effects of ineffective planning and preparation. Organisations, and indeed society as a whole, are constantly dealing with the issues associated with an increasingly complex, technologically driven, global commercial market. The demand and availability of skills required to capitalise on any investment in technological developments are far from being matched. Consider Figure 1, a catastrophic cusp, with two driving factors: The design, deployment and

resourcing of organisational business processes and the deployment of advanced technological infrastructure. The cusp was considered to be the most appropriate in that it demonstrates that sudden jumps in overall organisational performance can be governed by two predominant factors. One could argue that the complexity of the issues being considered are multi-dimensional, but for purposes of simplicity at this stage it was decided to use two dimensions.

The passage between $C \rightarrow A$ are relatively straightforward in that it reflects the effective installation and implementation where project plans cover every aspect of risk from infrastructure installation, staff training and testing. Similarly the decommissioning of installed systems can be equally successfully managed $A \rightarrow C$. In both cases the outcomes are clear with a defined deadline for which the process can be effectively planned and managed.

One of the problems facing many organisations is the path from $C \rightarrow D$ where the return on investment is not being truly realised, and can result in $D \rightarrow C$ over a period of time.

The passage between $C \rightarrow B$, and even $B \rightarrow A$, is relatively straightforward and with minimal risk when the pool of available resource is plentiful and the business processes well established. Mechanistic organisations where the skills are generally readily available, and even when there is a variation in demand, the transition can be managed effectively where demand and resource availability are matched (ie between $C \rightarrow A$ and $A \rightarrow C$).

The primary concern relates to the general degradation in performance as reflected in the $A \rightarrow F$ pathway which reflects a critical stage in organisational performance. If at stage F the managed change can result in $F \rightarrow A$ then management clearly has fulfilled its responsibilities. If, however, the performance results in a continuation from $A \rightarrow F \rightarrow G$ then serious management situation exists with a step change in performance to H . Stage H is critical in that inadequate corrective measures could result in the organisation reverting to D . However corrective measures could result in $G \rightarrow E$ with a successful recovery path going $E \rightarrow F \rightarrow A$ ideally.

However in organic organisations where dependency on specific skills, or talent, can result in the transfer from $A \rightarrow F$ resulting in a catastrophic change in corporate performance to state E via G and H . However, inadequate management could easily result in $E \rightarrow F \rightarrow G$ resulting in a continual existence within the hysteresis loop. This is an uncertain, fire-fighting existence where management is constantly failing to cope with the shortage of available skills. Clearly the aim is to secure a more stable, steady-state supply of relevant skills, which is clearly difficult in a continually evolving, technology driven, environment. In other words “getting ahead of the curve”.

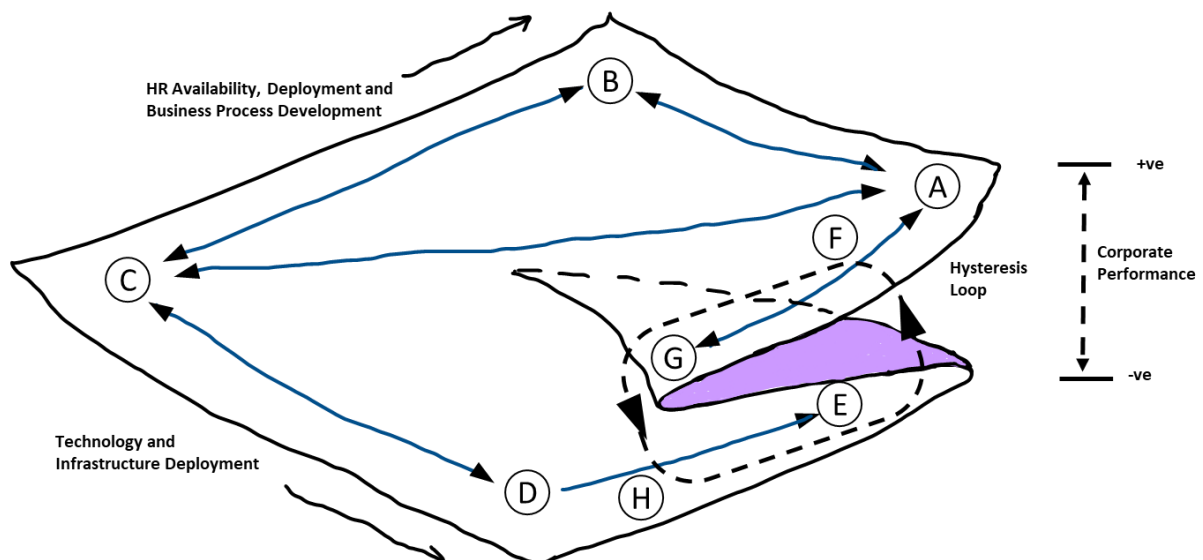


Figure 1: Catastrophic Cusp

The hysteresis can be triggered by a number of reasons from changes in corporate ownership, outsourcing, mergers& acquisitions, relocation or just corporate strategy and related operational procedures.

Such deliberations need to be factored-in if we are to avoid future hysteresis particularly when the assumption is that the technological platforms and infrastructure upon which the stable steady-state remain agile and support the change. As has been highlighted by the recent pandemic which has forced a number of corporations, many unaccustomed to such flexible models, to adopt a working -from-home policy. Clearly the success of change is about minimizing the impact of change by forward evaluating the associated risks and adopting mitigating plans.

Real World Observations : Management of technology often looks to the future in maximising the benefits it offers, or more importantly, what it can offer if used ‘properly’. Too often ‘properly’ in management refers to practices that utilise technology to its utmost. The focus on technological use should also factor in ‘fit-for-purpose’ within the current environment. This being significantly highlighted during the recent pandemic where management did not consider minimising the social impact of employee’s which affected corporate relationships. Simply stated is technology letting us down, or are we blaming it for our corporate and individual inefficiencies in maintaining normal operational mode following any change that is introduced (Pan(2020)).

Normal operational business processes reflect the working-day techniques employed by the individual employees working collectively in compliance with adopted organisational processes. So the question is are management reflecting TI in ensuring that employees are appropriately supported with the allocated technology and embedded applications when working irrespective of location. The SARS outbreak in 2003 highlighted a number of corporate shortfalls in disaster recovery plans. Many of the issues we face now were highlighted then but the implementation of preparatory business procedures were always pushed back allowing for more, apparently, important initiatives. Surely now it is time to take stock and prepare for the next infection – whether human or cyber. The high turnover of employees can be attributed to a number of factors, many of them totally disconnected with the technological infrastructure upon which business regards as a major foundation to their organization, certainly investment wise. Managing Technological Impact (TI) is becoming a key success factor in the current business environment: Gaining and retaining key skills is impacted by the management of the day-to-day working environment that is experienced. So what focus should management have on the TI perspective?

The basis of this approach is that business practices should consider technology management rather than allow embedded systems to determine or even dictate best practice. The reality is that most working office automation works on the basis of 80:20. That is 80% of staff use 20% of the functionality available. Most users use what is useful: Stress and frustration arise from often being coerced into using overly sophisticated systems that are not seen to contribute any value to the solution of the problem in hand. In our deliberations should we consider such future impacts whether as a result of crisis management or business-as-usual. The need is to rethink what is best practice and train for effective remote working and demonstrate true corporate citizenship. In addressing the corporate dependency on technology and the potential impact of a damaging hysteresis the management of TI needs to reflect on the appropriateness of the technology and the symbiotic relationship with business processes. Indeed how do we assure a quality working environment for those employees in situ and avoid the loss of any valuable human resource. The third element of the troika of managerial skills (ie TI) is key to securing the base of human resource skills and ensuring the effective deployment using the technological infrastructure.

Optimal : The managerial focus has to be on fit-for-purpose for both existing and new business environments whatever the situation we find ourselves in. The normal office working environment has encouraged the development of a ‘meeting culture’ which has been extended into remote working. The extent to which remote meetings can be effectively held is clearly dependent on bandwidth availability and the degree of familiarisation users have with the remote-working systems being used. Lack of corporate standards favour the enthusiast, those unfamiliar will feel under pressure as they are not possibly using the available functionality to its maximum as perceived by its usage by colleagues. To remove the demand for extensive system usage it would make sense to remove the dependency on meetings and empower staff to work independently. This removes the need to schedule time to discuss every situation fostering employee empowerment and encouraging effective working. Without doubt meetings are necessary so the focus should be on ensuring they are designed to get the most out of the time allotted. Narrowing the scope of the discussion and focus on the issue(s) being addressed – i.e. the point of the meeting – clearly helps. An appropriate agenda reflects a purposeful approach to the meeting, rather than that of a hastily convened session because we can: whether we like it or not technology has resulted in us being contactable, unfortunately! Too often technology places psychological pressure on its users with the adoption of a ‘*here and now*’ mentality.

Another common criticism of working remotely is being inundated with emails. Clearly it helps sending emails to facilitate communication between remote workers, however the obvious danger is that critical communication is missed in the noise of mass emails. In particular is the use of reply-to-all! There are examples where the 'reply-to-all' can overload individuals and corporate systems. Emails should be effective and thought be given to 'who needs to know what' question: A question that should be reflective of all managerial decisions relating to the dissemination of information. In deciding who needs what information due consideration should also be given to *why*. In answering those questions it ensures that management is clear about the workings of the business processes and what information is required to successfully perform the duties expected.

Nurturing: We need to control technology in our lives. Societal pressure has resulted in technological intrusion. It should be managed, as should the time allocated to the working day. Just because the equipment is there doesn't mean it has to be used or justified. There needs to be more focus on individual rather corporate needs. Often technology fosters a culture of informal surroundings which can blur the boundaries between individual, and indeed group, responsibilities. Formal relationships with subordinates and peers within the office are significantly different when remote working as it does impose and affect the mental health of some individuals. Respecting individual scenarios and ensuring effective, empathetic, working conditions is welcomed and rewarded through employee loyalty. Technology and embedded applications are often introduced, or in some cases imposed, on extant working processes with the aim of increasing efficiency. However improving effectiveness may necessitate a review of working practices to achieve a more desirable effect from all viewpoints. A classic example of this is evident in many areas where the proliferation of technological use has resulted in many, what would normally be called administrative support staff, being asked to undertake technical support: e.g. advice on setting up video conference sessions, or the more generic 'do you know how reformat documents in...'. In many cases the reluctance to provide the technical support sought is mainly due to adequate knowledge, as it isn't their role or area of expertise, rather than the often perceived blanket unwillingness to help. This doesn't help working relationships! Adequate technical support, particularly for remote workers, is a critical success factor in any business operation.

Feeling comfortable has physical as well as emotional components. It is clear that the equipment for remote working is largely based on the presumption that personal workstations or work laptops use existing bandwidth connections. That statement alone has a lot of assumptions as not everyone has the same computing power and network accessibility. Network connectivity varies according to region and service provider. Corporate standards are invariably not specified or provided and so some staff may feel under pressure when their normally adequate domestic network connection embarrassingly fails in crucial work discussions. It is the responsibility of the employer to ensure that adequate resources are provided, or the sub-standard performance of an individual's environment is acceptable. Going forward these factors need to be considered if remote working is a possibility as is the procurement of a decent camera, microphone, bigger monitor, separate keyboard and even a chair!

Encouraging staff to self-learn greatly assists overall confidence, which with appropriate empowerment, significantly contributes to team spirit and loyalty. It is clear that the best developers of application usage are the users themselves. Too often those truly involved in the day-to-day usage of installed technology do not get consulted, particularly those who primarily see problems: the rollout of IT projects involve tech savvy enthusiasts who do not see the obstacles one experiences when under pressure. Encouraging staff to explore alternative options/approaches can only add value if for no other reason than perhaps what is installed is the best solution after all.

Informative: As already stated too much information can be a problem. Emailing a spreadsheet which contains every possible permutation is not helpful. Certainly emailing a spreadsheet or table to a lot of people for self-ratification by demonstrating that something has been done just exacerbates the problem of data-drowning. Concise dashboards concentrating on particular issues help to focus people's attention, and subsequent discussions. The work being done should add value, both corporately and individually, and be measurable both quantitatively and qualitatively. Not only is it essential to get the correct perception of extant working procedures but it is also essential to be able to formally assess the effectiveness of employees working in this way. Formally assessing individual (and corporate) performance is an ongoing managerial requirement. Acquiring effective, and appropriate, information is key in maintaining managerial control. One of the frustrations of working remotely is knowing where corporate data is within the labyrinth of adopted systems and databases. Navigating around the complex infrastructure is normally ably assisted by polite interjection from an office colleague basking in the knowledge of knowing something you don't and exploiting it (in an office banter fashion) with others. But this informality is effective and works. The disconnection of working remotely makes

that interaction impossible: Posting questions on noticeboards or sending a text message or trying to get a meeting/chat simply is ineffective. The fundamental question that needs to be addressed is what information do we need? Is the system providing what I need, or is it providing what somebody thinks is needed. Highlighting the disparity between those who think they know the job and those that actually do it. Ensuring people have the right information at the beginning is not only obvious but crucial when remote working. It isn't the simple issue of being inefficient, the additional stress of feeling inadequate or embarrassed to ask just creates unnecessary and unwarranted pressure.

Day-to-day managerial processes obviously need to continue and annual staff assessments will need to be conducted. Although they be conducted under the umbrella of being sympathetic and understanding, as time progresses remote assessments may become the norm. Under such circumstances do we have the data to perform such an assessment as the dangers of not assessing the situation correctly could easily backfire with staff becoming even more disenchanted with management and its corporate culture. Although the technology enables us to be dynamic, agile, in the way we work care must be given to the way the captured information is gained and used. How one acquires the data needs to stand up to scrutiny as much as the data itself.

Tenable : Working relationships need to be tenable whether working in the office or online. Technology should be there to support in the development and operation of business-as-usual functionality. Often technology is used to plug gaps in operational processes. Too often information is disseminated without true context or relevance, because it can be, and it is left to the recipient to discover its usefulness. The time dedicated to this discovery and the application of this information has to be worth it and not dissuade users from further engagement. Processes need to be robust whether working in-office or remotely, and easily reversible. Colleagues should not feel disadvantaged irrespective of the incumbent *modus operandi*. However the business processes need to be auditable for quality assurance whilst being legal. Collecting the necessary information that enable processes and staff performance to be analysed needs to be carefully considered. Trust is key in any form of remote working scenario. The use of sophisticated remote data gathering systems that try and assess individual performance via any technology let alone personal, home-based equipment needs to be vetted under the auspices of any corporate data protection. If challenged would the integrity of the information/evidence and/or the manner in which it was acquired stand up to scrutiny.

The integrity and security of any retained data also needs careful consideration particularly within corporate contractual situations, which could potentially deteriorate. Recording confidential (ie disciplinary) or contractual meetings needs agreement from all parties. Customer data needs to be kept safe – on home systems used as well as corporate provided equipment. Another factor in maintaining colleague camaraderie is with the knowledge that the human resource guidelines are clear. Work overload and the stress it causes is an issue and a corporate concern and time-management is key. The focus is then on who responsibility for managing it, and is delegation to staff clear and consistently/uniformly applied. Whether it is deliberate or not the boundaries of responsibilities become blurred when working remotely. The problem exacerbates the issue of individual responsibilities when the technology intended aimed to smooth workflow blurs expertise which is often accepted when working remotely but causes issues when returning to the office. Notwithstanding the importance of reassessing the practicalities of remote operational restrictive practices on business-as-usual efficiency there are also the ethical and professional factors to consider. The factors are heavily dependent on the type of business being conducted. Clearly professional services have to consider many ethical questions regarding client confidentiality, validity of data being recorded in relation data protection and legal framework (ie rules and regulations) in which the corporation operates. In addition the *modus operandi* for remote working and 'new normal' has to ensure that the dignity of the office is upheld. It is imperative that the office of management and senior professional positions is not compromised and the positions held by people are respected when we emerge from current restrictions.

Concluding remarks : Too often the approach taken by management to mitigate any risks is to involve external business consultants to revamp existing processes to utilise new or extant technology on a best-fit basis. Even adopting that approach understanding how the business works, in both in-person and remote modes, and asking what needs to be changed to make them work better is key to success. 'Asking' is often overlooked as a way of improving processes and relationships on which all corporations rely. Much of what has been stated will resonate with many, and even be derided by those who may say 'so what'. But the reality is in front of us and the willingness of those to embrace the advantages of future technological advancements is dependent on how well extant systems are embraced within current and imminent business environments. Should the days when technologists, and their distributors, know better be behind us. It is management's responsibility, indeed duty, to

be in control of the deployment and implementation of business processes encompassing, human and physical resources.

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