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# **Open Performance Management: the Internet and electronic observability**

***Steve Little***

## **Introduction**

Information systems play a key role in the process generally described as “globalisation” and, as a consequence, new perspectives on performance measurement are emerging as new information and communication technologies are deployed to maintain cost-effective transactions across an emergent global production system. The relationship between new information technologies, globalisation and social and economic exclusion has become a focus for discussion amongst a range of social theorists (Castells, 1996, 1997, 2000; Giddens, 1999, Ohmae, 1995), however, this Chapter focuses on the implications of this new connectivity and observability for performance management.

The diffusion of information and communication technologies (ICTs) from the advanced economies in which they were developed to a wider range of locations has allowed global production networks to emerge. Whether dealing with manufacturing or services or any combination of these activities, performance now reflects a more openly negotiated set of measures in an increasingly networked environment. The production chains linking peripheral sources of materials with a technologically advanced core can be managed and for the first time monitored closely and continuously. This integration of information and communication technologies into

business processes presents the opportunity to capture data on performance at a relatively low cost.

Tapping the data streams of the value chain from suppliers through to customers offers new insights into performance and also presents an opportunity to leverage the internal resources available for performance management with those of a wide range of stakeholders. Increasingly value is added through the organisation of the data and information generated by the control and coordination of these processes, whether in high or low volume and high or low value transactions. For example, the e-business model of Amazon not only tracks each customer's on-line behaviour but also then prompts them with suggestions that may elicit further information. This both adds value to the transaction for the customer, and shapes further that customer's profile. This approach is equally valuable in business to business relationships within the production chain, and at high value. Aero engine manufacturers now sell the power from their engines as a guaranteed output for the customer, while the real-time monitoring of these engines in use through satellite technology delivers the level of performance measurement necessary to deal with the most demanding client. However, the monitoring by a firm also facilitates monitoring of the firm by customers, and while this tension has become acute in certain sectors, ultimately it offers a redefinition of performance measures in concert with a wider range of stakeholders.

Governments, or at least those with a commitment to democratic accountability, have found that their performance at local and national level is subject to new forms of electronic public scrutiny, most strikingly (at the time of writing) in the case of the logging of 'rendition' flights on the internet and the subsequent calling to account.

Top-down models of e-government based on traditional relationships are challenged by such public engagement. This new transparency offers advantages and disadvantages to both sides. Tax self assessment is an initiative which places a burden on taxpayers who in return expect a level of support based on their experience of 24/7 responsiveness in the commercial sector, not on their traditional transactions with government.

The remainder of this chapter sets out the wider context in which performance is now judged, and provides examples of both reactive and proactive responses to a new networked transparency

## **The context of new performance dimensions**

Dicken (1998) describes a generic production chain drawn from Porter, (1990) to analyse the dynamics of the global economy. In common with Porter's representation of the value chain the model allows the identification of the critical support activities which support each stage of value creation. Dicken separates these into flows of materials, personnel and information on the one hand and technology and research and development functions on the other. Innovative components of this system often emerge from smaller and medium sized specialist companies which in turn must take into account requirements determined by a global system. However, participants and contributors at all levels of specialisation must respond to both severe cost competition and shorter product life cycles in which to recover investment. Product differentiation and customer support can maintain demand for goods and services and maintain premium prices for them.

Many established companies have responded to the competitive pressures on their cost-base by shifting towards the higher value end of the production chain. Such a shift makes the distinction between products and services less obvious. It also leads to an intensification of knowledge requirements since a focus at this end of the chain requires closer adjustment to cultural variation among users and customers. This pursuit of higher value activities can be seen in both new and established forms of production, as with the examples of new e-business models and established aerospace companies.

Once an organisation begins to operate in an external information space, its own performance becomes exposed to external scrutiny and benchmarking becomes an activity undertaken by consumers and consumer groups, as described by Naomi Klein (2000). Klein argues that there is a shift in focus by what were formerly manufacturing organisations, hollowing out material production through outsourcing and replacing it with a form of cultural production intended to maximise intangible values. She argues that the apparent global expansion of high profile brands is in fact accompanied by the progressive subcontracting of all functions except the management and development of the brand itself. This represents the logical end-point of outsourcing strategies facilitated by both a reduction of transaction costs and the alteration of the relative advantages and economies of size. These changes place intellectual capital leveraged by technology at the core of business. Brands are becoming the carrier of the core values and emotional capital of what were once physically extensive organisations that have been reduced to sets of networked relationships.

The internet now represents a key communication base for social and political

movements and freedom of access to it is increasingly regarded as part of broader freedom of expression (Reporters Without Borders, 2006). As the skills and awareness of the new monitoring capability have diffused a reverse panopticon has been created, in which formerly peripheral locations can shadow the developments at the 'centre' and can develop a capability set of their own that can be electronically inserted into the broader pattern (Little and Grieco, 2006).

The global deployment of brands therefore creates global exposure, increasingly exploited by the campaigns targeting high profile brands. As noted above, entry into a global electronic space brings the prospect of profiling and monitoring of and by external stakeholders. Campaigns which challenge brand identity have emerged from within organisations, as with the Walmarters, employees of Wal-Mart reporting their work experiences<sup>1</sup> as well as from the traditional labour movement and broader social campaigns. The emergence of a countervailing meta-brand in the form of the logo of the fair trade movement represents the cooption of the approach by its critics.

Even where value chains and networks operate across a range of jurisdictions actions can be monitored relatively easily in the electronic form. The complex coordination afforded by the global ICT structure has been mirrored by a counter-coordination initially within labour movements traditionally concerned with communication. The traditional long distance coordination among dockside workers was supported by a web-site which proved critical to these efforts during the Liverpool Dock dispute of 1995-8 (Bailey, 2006). South African activists have leveraged their skills in international mobilisation developed during the apartheid era to develop internet campaigns in collaboration with social movements around HIV and health issues. More traditional workplace concerns are also being pursued through this technology

uniting workers for Volkswagen from Germany, Brazil and South Africa in campaigns over pay and conditions, with grass-roots activists circumventing the position of the union hierarchy. Equally significant is the organisation of the consumers of the goods and services produced by transnational systems. The growth of the Fair Trade movement is one consequence of such monitoring, where traditional consumer perceptions have been leveraged by the electronic environment in which organisations now operate. All of these movements present challenges to the definitions of performance and related goals espoused by commercial organisations.

## **Open Performance monitoring: cases and examples**

The interaction between company strategy and stakeholder campaigns shows evidence of both conflict and synergy between the internal perception of priorities and objectives for performance and the dimensions of performance seen as critical by external constituencies. This interaction increasingly takes place in cyberspace, and the following examples represent both the process that supported the discourse and an archive of action. The examples here involve two high value global industries – pharmaceutical and aerospace.

### ***Example I The pharmaceutical industry: defence and counter offensive***

The life-saving technology provided by the pharmaceutical sector has attracted particularly close attention from consumers. Pressures on ‘big pharma’ from wide-based social movements of the vulnerable are having their effect. The concessions made by pharmaceutical companies over the pricing of AIDS drugs in Africa

represent a triumph of political pressure over legally defined intellectual property rights which undermine the logic of existing company strategies.

Not surprisingly, the pharmaceutical industry provides examples of how definitions of performance and value have been contested for some time<sup>2</sup>

For every 5,000 to 10,000 compounds screened by the testing process, only some 250 will become lead candidates for clinical trials (Bernard 2002). Of these as few as five drugs will enter clinical testing, with only one likely to achieve approval for use at the end of the three phases of clinical trial. Much of the protected licensed period will have elapsed before this drug is sold into a market in which governmental and private medical insurers are becoming increasingly concerned about cost inflation. Once the protection expires, other cheaper manufacturing locations are able to produce generic substitutes for the original proprietary product.

The high attrition rates at every stage and the need for the recovery of vast costs means that companies are searching for increasingly elusive "blockbuster" products. There are failures in use and controversies over value, efficacy and cost. The world wide vice president of GlaxoSmithKline (GSK) was reported as claiming that most drugs work on less than fifty percent of patients for a variety of reasons (Connor, 2003). In this context, strategies for reducing the costs of such uncertainties are sought. The strategies sought include the involvement of low cost manufacturers and the accommodation of the generic market in profit models and the use of brands to maintain the value of a drug in the face of generic substitutes.

Global electronically-facilitated pharma production networks are emerging to challenge older integrated single company chains. However, this same global

electronic technology has allowed the emergence of more transparent meta-governance forms (Grieco, Little and Macdonald, 2003) with the stakeholders now including governments and regulators plus the ultimate end-users of the products. With the advent of globalised information technology, the drug development process is increasingly forced to accommodate the concerns of the ultimate stakeholders - the users of the drugs and those with the conditions and diseases targeted by global drug manufacture.

In the developed economies, the use of certain drugs is also being monitored beyond the formal regulatory processes. For example, on 13 October 2002 a television broadcast on the anti-depressant Seroxat used the BBC web site to elicit responses to the programme from users of the drug. These are now incorporated into an article in the International Journal of Risk and Safety in Medicine available on-line (Medawar and Herxheimer, 2003/4). In response the British Medical Journal web site provided a review article defending the class of drugs, selective serotonin re-uptake inhibitors or SSRIs to which Serotonin belongs. It argues that the benefits of these drugs outweigh any problems (Cowen, 2002). A Seroxat Users Group web site was available to promote the follow-up Panorama programme " Seroxat: e-mails from the edge", which was broadcast on 11 May 2003 and this site continues to carry campaign information<sup>3</sup>.

The model of intellectual property being promulgated as a global standard through the WTO Agreement on Trade Related Aspects of Intellectual Property and Public Health (TRIPS) agreements and the WTO is the one favoured by the major international pharmaceutical companies. However, the advent of the AIDS crisis in both developing and developed countries during the nineteen eighties led to campaigns and

actions which, in key cases, have achieved the political neutralisation of intellectual property rights. The TRIPS agreement makes provision for the “compulsory licensing” of protected drugs under emergency conditions. Such production is intended for use only in the country of production; however, many countries affected by AIDS do not have the necessary production facilities and inevitably drugs are acquired as unauthorised ‘grey’ imports. In April 2001, in the face of concerted campaigns in both real and cyber space, thirty-nine pharmaceutical companies withdrew from a legal action in the South African courts. This intended to use TRIPS rules to stop South Africa from importing or producing these cheap versions of patented AIDS drugs. Their withdrawal in effect, surrendered intellectual property to which they were legally entitled in the face of globalised political opposition. After failing to negotiate drug discounts from multinational patent holders, Brazil, Thailand and Cuba also opted to manufacture generics representing a clear challenge to the basis of the larger patent system. The 20-year market monopoly under TRIPS has been neutralised.

This monitoring of the global pharmaceutical industry demonstrates how distributed technology can provide a monitoring and mobilization device which widens stakeholder participation. It also forces companies to re-evaluate their understanding of performance in both financial and social terms by adding a meta-regulation by the wider stakeholder community to the governmental regulation of this industry’s activities.

### ***Example II SARS Collaboration and Synergy***

The campaigns around the AIDS crisis have led to an opening up of governance and

metagovernance of the life science universe and this has had positive results in other areas. The rapid formulation and coordination of a global response to disease was demonstrated by the highly distributed discourse around severe acute respiratory syndrome, or SARS. From early 2003 the Centers for Disease Control (CDC) Atlanta and the World Health Organisation provided information on the progress of SARS<sup>4</sup>.

Both the US Department of Defense Global Emerging Infections Surveillance and Response System and APEC (Asia Pacific Economic Cooperation) web sites continued to provide monitoring and a world SARS map remained available from the Indian company maptell.com for several years after the outbreak abated. During the crisis it was possible to compare the reactions of various national governments by visiting the health ministry web sites of, among others, Singapore, Taiwan and Australia (Little and Grieco, 2005).

It is clear that the big pharmaceutical companies and big governments such as the United States have become aware of the vitality of the negative image they have invited by permitting the development of institutional structures which preclude the world's poor having access to essential treatment. There is a growing awareness in business generally that the end user has the ability to organize globally in respect of product markets and in government that policies can be monitored and challenged.

The collaborative and synergistic response to the SARS outbreak and the continuing collaboration over a potential avian influenza pandemic demonstrates that a positive response to initially threatening interventions can be advantageous, and that ICTs have revolutionised the speed and extent of such collaboration.

### ***Example III: Aerospace: inclusion and incorporation***

Aerospace is a sector in which the external perceptions of stakeholder have been incorporated in to the product development cycle to improve performance and sustain relationships. This phenomenon is more often associated with customer engagement in fashion oriented consumer goods and has grown from a model of 'viral marketing' in which information is distributed surreptitiously through the social networks of potential customers (Kharif, 2000).

Boeing has a history of successful incremental development within successive technologies (Gardiner, 1986; Little, 2004) The impact of computer-aided design on the cost of development is evident in comparison between its products from the nineteen-seventies, such as the Boeing 757 airliner with the nineteen-sixties 727 model. By the nineteen-nineties, the design programme for the Boeing 777 model was highly dependent on integrated computer aided design systems which allowed significant savings in development time, and reduced the need for physical models and prototypes to a minimum (Sabbagh, 1995).

The relationships between aerospace manufacturers and aircraft operators have been close for decades, the development of aviation milestones such as the Lockheed Constellation and the Boeing 747 Jumbo Jet were instigated by key customers. The Boeing Company has distributed elements of both manufacturing and component production to target markets, with for example Japanese and Australian contributions providing risk-sharing and promoting buy-in. Airbus, as the principal rival to Boeing is now moving to establish an assembly line in China, currently the major growth market for mid-sized commercial aircraft (Matlack, Holmes and Balfour, 2006).

However, as with the emerging networked pharmaceutical production system, there

has also been a shift in the understanding of the relationship between prime and sub-contractors and customers. A combination of an increasing variety of leasing arrangements and the deployment of satellite technologies now allows the real-time remote monitoring of aircraft in flight. As noted earlier, this has led to new forms of customer support, and a refocusing from sales of aircraft, aero engines and spares to the support of “power by the hour” in order to capture a more stable income stream.

The Boeing “world design team” is a concept that extends the relationship with traditional stakeholders to the end users of the company’s products, including frequent flyers, accessing an additional perspective on performance<sup>5</sup>.

In addition to assembling some 35% of the new 787 from its plants around the US, Boeing also draws upon key foreign companies, both in their home locations and, in the case of Toray, a former textile company now expert in new generation composite materials, in their U.S. based operations. The software necessary to the coordination of these complex contributions is also a joint development with Dassault Systemes of France<sup>6</sup>.

The aerospace value chain has developed to capture suppliers and customers and to enrol both into the performance management system. At the same time the extension of the electronic coordination developed for manufacture to the broader user base allows the incorporation of customer feedback into the design system itself.

## **Conclusion: performance as the managing of presence and expectations**

When Manuel Castells described “informational politics in action” (Castells 1997 p.333) he was concerned with one aspect of globalisation, the reliance on simplified mass communication. He argued that this inevitably reduces the complexity of political discourse. However, elsewhere in the same volume he describes very different and complex forms of electronically mediated communication by dissident minorities: Zapatista rebels in Mexico and Militia groups in the U.S.A. The former have become the commonly accepted symbol of the use of the internet as a base for political opposition from the marginalised. In response the Mexican Federal Government has established its own presence in cyberspace itself, providing links to independent and critical coverage of events via its own web-site (Little, Holmes & Grieco 2000).

Other governments have sought to operate in this new space, and the concept of “e-government” is attractive in terms of economy, efficiency or both. SMS text has been trialed in conjunction with traditional postal voting in an attempt to increase voter turnout for UK local government elections. A more adventurous initiative is the on-line electronic petition system developed for the Scottish parliament. Griffin (2003) argues that this innovation allows central monitoring of devolved government functions.

However, other events have shifted the expectations of stakeholders further. The Hutton Inquiry (Hutton, 2004) posted UK Cabinet papers normally kept secret for

thirty years on the internet, along with the full transcripts of the evidence presented to the enquiry. This opening up of the political process via internet presentation permitted the global external audience to make their own assessments of the relationship of the official judgement to the detailed evidence. The narrow legal interpretation of Lord Hutton was subject to a broader political judgement, just as the narrow interpretation of intellectual property by Big Pharma was compromised by wider political mobilisation around the affordability of HIV treatments.

Elsewhere, however, pharmaceutical companies have engaged with campaigns and pressure groups where these coincide with their interests. For example, the adoption of Roche's Herceptin for the treatment of advanced breast cancer followed campaigns in several jurisdictions. The manufacture became involved directly in one campaign through the canvassing of patients to elicit their support for the use of the drug for early stage cancers, expanding the potential market, but also exposing a wider range of patients to the significant side effects (Boseley, 2006).

The aerospace sector offers a paradigm for more open and positive engagement with feedback, solicited and unsolicited through acknowledgement of its potential value. This co-option of potential criticism and its incorporation in performance monitoring represents a more robust response which fits with Bray's formulation of a "New public relations" (Bray, 2006). This allows communication to the stakeholders from the workers directly involved in an issue, relying upon their understanding of the company's goals and values to shape their presentation. Control is replaced by monitoring and mentoring in order to achieve a more direct and honest engagement with stakeholders

An organisation adopting Bray's approach faces two challenges. The first is to identify and interpret the external responses and reactions that reflect an adverse external perception of the organisation. The second is to identify and lead appropriate changes in corporate objectives and emphasis that will meet such a potential shortfall in performance and legitimacy. The research challenge of these changes in practice is to develop means to capture effectively diverse grassroots initiatives and to track changes in corporate systems which would allow meaningful access to stakeholders within the dual constraints of commercial confidentiality and data protection legislation.

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<sup>1</sup> See <http://walmartwatch.com> (accessed 23 July 2006)

<sup>2</sup> See for example <http://www.global-campaign.org/bigpharma.htm> (accessed 23 July 2006)

<sup>3</sup> See <http://www.seroxatusergroup.org.uk/> (accessed 23 July 2006)

<sup>4</sup> See CDC at <http://www.cdc.gov/ncidod/sars/> and the WHO at <http://www.who.int/csr/sars/en/> (both accessed 23 July 2006)

<sup>5</sup> See <http://www.newairplane.com/> (accessed 23 July 2006)

<sup>6</sup> A detailed breakdown of contributors is available at <http://www.newairplane.com/en-US/FunStuff/Multimedia/SupplierMap.htm> (accessed 23 July 2006)