Information Technology, Disruption and Disorder: Australian Customs and IT.

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Abstract:

Information and Communication Technology (ICT) is often implemented in order to increase efficiency, reduce duplication, simplify labour and improve the flow and handling of data. However, everyday experience shows that this does not always result. ICT implementations frequently fail and when they are successful they can increase complexity and restrict actions. Previously simple procedures may become complicated and local flexibility be constrained. Governance can be distributed through the system, so that it becomes unclear who, if anyone, has responsibility. Users have to learn how to 'fudge' the system in order to function.

This paper investigates the ways in which ICT adds to the chaos and complexity of contemporary life, by taking this disorder seriously. Disruption and disorder are not treated as a residue but as produced by the modes of ordering employed. It is not assumed that technology is either determinate of social life, or that technology is subordinate to organisational or managerial demands and control, but that technological solutions are often disruptive in themselves. Furthermore it is important to recognise that ICT is also not always the same, and its effects not always the same. Implementers of software cannot afford to ignore the social conflicts of which ICT is a part, or with which it engages, or else these conflicts will worsen or be driven underground where they will emerge as disruption.

The paper details the ways that ICT can 'fail' and can increase disruption and disorder in social life, and investigates this disorder/order complex in the Australian Customs Service's long delayed Integrated Cargo System which which led to customs, importers and exporters having severe problems doing old work, and lengthy delays on the docks. The main problems turn on conflicts between social groups and upon the compounding and intensification effects of the software system.

Table of Contents

Information Technology, Disruption and Disorder

Section 1: Introduction

Information and Communication Technology is often implemented in order to increase efficiency, reduce duplication, simplify labour and improve the flow and handling of data. However, everyday experience shows that this does not always result. In software implementation, the recurrent failure of process and safeguards is well known. Saran (2003) writes that:

> In a survey of 450 IT directors across the UK, Germany and France, 73% said they had suffered major faults in their IT systems. Respondents said the lack of quality in software had a direct impact on their business. Thirty six per cent reported that IT failures had led to 'considerable reduction in turnover', and 43% said poor software quality led to a substantial drop in staff productivity. Forty five per cent said poor software quality had damaged the company's image among clients and prospective clients.

In 1995 the Standish Group estimated that in the US alone, "at least $185 billion is wasted on development projects that fail, often because the software does not satisfy user's needs" (q Hickey et al. 2003: 279).

But even when failure is not obvious ICT often makes things more difficult or increases complexity. For example during the course of writing this paper, I bought a new computer and disks which were readable on the old computer were *occasionally* unreadable on the new, despite still being readable on the old. 'Improved' word processing software frequently situated footnotes on the wrong page and produced much longer documents requiring more storage space. The new computer also seemed prone to use disastrously large amounts of CPU time for unspecified programs which were undoubtedly supposed to make it work better. Some of these issues were later fixed but they caused otherwise unnecessary disruption. In general, with new equipment improved with IT, operations that most people used to find simple are now more complex. For example, buying a new TV now takes more than just plugging in, it requires a lengthy technical manual (usually not written in standard English to make it harder). Car repairs, which could once be performed by a backyard mechanic, are now so complex that a trained engineer will often have to buy a new computerised part which can cost more than a standard PC. A power cut can result in a lengthy round of reprogramming devices throughout the house, if anyone can remember where the

manuals are to help them do this. Innumerable humorous articles can be found on the perils of programming a VCR, or trying to complain to a computerised customer answering service. Our new item may offer us so many options that we cannot cope, or have to get specialist help. ICT can also cause loss of local knowledge (if it's not in the system it does not exist) – rendering local action more difficult, and it encourages the rapid and humanly uncheckable accumulation of unforseen consequences which may result in chaotic breakdown. As networking means that breakdowns are interlinked rather than separate, they may be harder to locate as well as require fixing in different locations. Things which seem to be minor issues can have systemic consequences. Similarly the Internet by bringing people into otherwise implausible contact can also force them further apart, by increasing the chance of conflict and by promoting the need to differentiate from each other in order to confirm their identity.

ICT seems to have no boundaries, it is always expanding into new fields which can make people, especially people with little experience, feel overwhelmed, sidelined, or not recognised in their own full complexity and individuality. Similarly when dealing with government or businesses it often seems that we have to contend with inflexible pre-programmed categories rather than reality. The order promoted by the software and its interconnections does not match with the tasks which have to be done. We hang on to our call, waiting and hoping that their friendly efficient computerised answering service can deal with our request and often, after a long rigmarole of button pressing, we finally get passed on to a human who cannot deal with our request either – frequently because the computer will not let them. Workers and users find that they have to learn how to 'fudge', or 'workaround', the system in order to function, and usually do not last in their job long enough to learn all the options. For some examples of unexpected disruption see Markus (1994), Tenner (1996), Ross & Chiasson (2005).

ICT allows governance to be distributed through the system, so that it becomes unclear who, if anyone, has responsibility. Distributed Governance resembles Negri and Hardt's 'Empire' as it becomes a power that is decentered and deterritorialised with no fixed boundaries or barriers. Socio-political models are hidden in the software so that, as Henman implies (1997), computers themselves become political players and political forces, and uncertainty or inflexibility increases again. Members of an organisation may employ these hidden models, or the diffuseness of responsibility, and

their greater access to options, to implement their own projects at the cost of the general, leaving those lower in the hierarchy feeling confused and helpless; thus increasing resentments in the workplace, or among those subject to the computerised administration. Additionally, if the structures or channels of communication are fundamental to the way an organisation functions, then changes to this structure through changing ICT (especially distribution of governance), may change the organisation in unexpected ways disrupting its operation still further.

It needs to be emphasised that this disruption does not arise simply because technology fails. Disruption can arise because technology works too well or is too successful. Thus it could be suggested that many environmental problems have arisen because of the effectiveness of fossil fuel powered engines. If they had been less effective then there would not have been as much pollution, and they would not have such wide distribution. We would not have been able to chop down so many trees, or extract as much oil as we have for as long as we have, and thus we would not have been able to disrupt the global climate and thus need more power for air conditioning or heating. If computers had not been so successful then we would not have problems disposing of them and the poisonous substances which go into their construction. If ICT did not make data collection so easy and efficient, then we could not be defined by our data trails, and have our identities abducted. Similarly modern military technology is so effective it is almost impossible to defend against it, rendering the standard establishment of order through force equally difficult.

This paper argues in favour of taking this production of disorder seriously, not treating it as a residue or a glitch but as part of, or as produced by, the modes of ordering employed. It is asserted that order and disorder are not independent of each other – they appear as part of an order/disorder 'complex'. A new way of ordering can produce new forms of disorder – after all there are many more ways of things turning out wrong than we can ever predict and usually only one way for them to turn out right. Sometimes the way of ordering may generate the chaos that people in charge use to justify that ordering, or to exploit that ordering. The Inquisition generated witches and heretics via its mode of uncovering them and removing them. A police state starts arresting innocent people to quell disorder and to show its strength and indispensability, thus producing more discontent and more likelihood of further

restlessness, even terrorism. However, sometimes, it is possible that people can use the disorder to derail those doing the ordering. Whatever our particular desires, it is probably better to look at the way we produce disorder when we think we think are ordering things, and in that way we will be far more open to the possibilities of working with reality than against it. It also lessens the chance of over-easy explanations of recurrent disorder as resulting from 'incompetence' or 'sabotage', which tend to feed into the already existing social conflicts around the technology.

If we are prepared to take self organising systems seriously, then perhaps we should take self disorganising systems equally seriously.

The widespread sense of disruption produced by ICT can be seen by the fear aroused by the Year 2000 bug or Y2K. That relatively little happened, still demonstrates that the fear and sense of chaos or disruption around ICT is intense, and cannot be ignored. If not accurate in this case, it may express a more everyday sense of disruption of life. If software projects generally run over time, over cost, end up preventing previously simple actions and generating new problems, then this cannot be taken as just an aberration.

After setting out some precursors to the idea of the order/disorder complex, the paper investigates the complex in the Australian Customs Service's long delayed Integrated Cargo System which involves linkages and work over the internet, and which has lead to customs, importers and exporters having severe problems doing old work, and lengthy delays on the docks. Readers who do not wish to deal with the theoretical background and literature review are advised to skip to section 4 'Preliminary Theoretical Conclusions'.

Section 2: Order and Disruption

In this section, the paper touches briefly on the various ways that the production of disorder has been dealt with in Technology Theory, Political and Social Theory, and Economic Theory.

Disorder and Technology

There has always been a sense that technology is disruptive and somewhat outside of human control. The strongest statement of this position is 'technological determinism', in which the structures, organization and 'needs' of technology determine the process of history and the organization of society. This position has been adequately criticised elsewhere, and in any case tends to reduce social disruption to a transitional stage or yet another residue, as well as rendering social divisions around the technology entirely secondary. More subtly Langdon Winner (1977) has proposed the idea of 'autonomous technology' as "a general label for all conceptions and observations to the effect that technology is somehow out of control by human agency" (1997: 15). After analysing a series of case studies Winner argues that the sense of technological autonomy comes from two sources, "an actual process in the world" together with the "predispositions (=*taipumus*) of [certain people] in society to allow the change to continue with little intervention". This formulation potentially reintroduces social division and conflict to the equation. These factors, continues Winner, create a "forceful movement in history which continues largely without conscious human guidance" (ibid: 105). Indeed the process can result in what he calls 'reverse adaptation': "the adjustment of human ends to match the character of the available means" (ibid: 239). It might be suggested that no matter how bad the technology is people will adapt to it, and these adaptations will become standard operating procedures. These adaptive procedures will involve social organizations, status, and distributions of knowledge, which may be completely inexplicit or invisible to management (perhaps by their nature, and perhaps as an attempt by workers to make themselves valuable to management), and which enable the technology to function. In this case, attempts to improve the technology will encounter these organizations and disrupt them and the ways that people do things. The whole system may then no longer be able to function properly.

However, yet again we are left with the idea that disorder arises from incomplete order, or conflict between orders, rather than from the ordering, although the kind of breakdown he calls *apraxia*, were "if a significant link in a technical system ceases to function, the whole system stops or is thrown into chaos" (ibid: 186), is much more a product of the ordering.

A number of other writers have addressed unintended technological effects by focusing on the accidents resulting from complex systemic interactions between parts of the technology. Despite Winner, such work is usually taken to begin with Charles Perrow's *Normal Accidents* (1999, originally 1984). Perrow observes that attempts to make complex systems safer may add further levels of complexity and thus paradoxically make things more dangerous. Another feature he points to is *coupling* (which is in some ways like Winner's apraxia). In lightly coupled systems disruption at one part of the system is rarely transferred to another part, while tightly coupled systems amplify or spread problems throughout the system. Sadly, this concept can become a post hoc description rather than a predictive theory. Despite arguing that people become part of the systems they build and operate, and thus that technology cannot be separated from social organisation, and pointing out the social aspects of accident location – "the issue is not risk, but… the power to impose risks on the many for the benefit of the few" (ibid: 306) – the book has little observer-based research of social systems, and reduces the issues to (good) design or individual people. Finally he tends to consider catastrophic aspects of technology failure rather than the 'normal' disordering aspects of imposed order. Similar remarks apply to developers of this approach such as Sagan (1995), Tenner (1996) and Chiles (2001). Other studies of technological failure, such as Dörner (1996), focus entirely on aspects of human thinking, as if these could be divorced from social situation and technology.

Software Engineering or Management studies of chaos and software tend to take as their first principle the idea that chaos and disorder are aberrant and only arise from failure to implement, or manage, the project properly (e.g. Burke & Morrison 2001; Glass 1997, 2002). It seems to be a standard technique amongst people writing on this subject to say something like:

> Most IT experts agree that such failures occur far more often than they should. What's more, the failures are universally unprejudiced: they happen in every country; to large companies and small; in commercial, nonprofit, and governmental organizations; and without regard to status or reputation (Charette 2005: 43).

They then propose that the solution lies in better management, as if this would not be obvious, or if this was not something which people had constantly tried without success. Indeed in some cases writers seem eager to make sure it is clear that failure is never the fault of programmers or software designers (See Jones, 1995, Flowers 1996, Cooper 2004). Depending upon the source of comment, blame can also be apportioned to the users who are described as too stupid to either workout the new system or to be bothered to learn all its new whiz bang features.

As a result of this knowledge and expectation of failure, "hundreds" of 'Requirements Elicitation Techniques' have been developed to determine user's needs, but "the majority of these techniques are rarely if ever used by practitioners. Solutions appear to be available, yet we continuously fail to make use of them" (Hickey et al. 2003: 280). According to interviews conducted by these researchers sometimes the techniques are not utilised because there are too many of them for the appliers to be familiar with the differing strengths of each, and sometimes because of social factors like company disinterest or a perceived disjuncture between academic research and practical workface application (which might be defined as a social factor such as group rivalry). However, again, the ultimate recommendations to improve communication and management seem oddly trivial and fail to acknowledge that if the chaotic procedure is repeated and common, it cannot be regarded as negligible or as a residue, or as easily controllable. It might be the case that these management solutions would not work either, but this could always be excused as an individual application of the wrong 'solution', or as another failure to apply the procedures 'properly'. We can always find management mistakes – these do not explain the errors, as mistakes happen even when things work. There are also always contradictory management principles, one of which will have been broken and thus the recommendation can be made that the opposite should have been applied.

By apportioning blame these studies do recognise social factors and divisions, but render them secondary. Social factors are perceived disruptions to smooth technical

process; in the difficulties in coordinating software written by different groups, based upon descriptions of what each other's software should do; and between the differing demands of management and workers, or between differing workers. Existent social fractures and groupings blame each other for stuff ups, as obviously it could have all been cured by competent management, or competent workers – but what if such competence had already been applied? This technique of blame also implies that everything would be all right *without* these social factors, or if these social factors could be eliminated – as if humans could be, or should be, stripped away from their lives and rendered perfectly 'rational', even when it is not certain which rationality should be deployed.

These studies do not examine the ways that people deal with the resultant distortions of reality and the disruptions of expectations, or even the ways that disorder is built into the process of implementation. Thus, Yourdon (1997) suggests that the "death march" style of organising software development (with impossible staffing, scheduling and budgeting), is not only popular with companies, although each death march seems to be a unique disapproved of event which adds to the possibility of failure. However, his book is more a celebration of this chaotic organisation and a guide to managing and surviving it, than an analysis of the social and technological factors which impel its recurrent use.

Another common 'blame factor' is that it is the complexity of problems, or the size of the program, which contributes to failure. However, while intuitively reasonable this is not always supported by evidence. Thus Fenton and Ohlsson claim in their quantitative study of ICT faults and failures that "It is not the case that size explains in any significant way the number of faults", and "Nor is it the case that complexity (or at least complexity as measured by complexity metrics) explains the fault-prone behaviour" (2000: 811).

To summarise: much of the anecdote and research suggests software implementation projects are conducted under huge pressure, involve frantic overwork, generally run over time, run over cost, and end up preventing people from undertaking previously simple actions. If these are standard results then they cannot be explained as aberrations or as resulting from incompetence, they are vital parts of the system.

Similarly blaming a lack of management or poor communication, seems to be part of the social ritual in which the importance of these latter factors to our form of social organisation is restated, and it is implied that such 'good' management and communication could exist, and do so normally and are thus cleared of blame in general. A cynic could suggest it also serves the function of increasing or protecting the status and salaries of other managers, despite the failure in management. The invocation of "best practices" is supposed to cure what is thus rendered an anomaly rather than a regular event. It would be surprising for anyone to ever deliberately implement 'worst practices', but perhaps it would not do any more harm. Anything, other than to imply that our modes of ordering actually contribute to the disorder and disruption experienced.

Disorder and Governance

Studies of governance, focus almost exclusively on the 'problem of order' – seeing chaos or disruption as something upon which order is imposed or as residual to order. Thus Hobbes alleged that people would fear chaos and surrender their freedom for imposed order. Marx implied that conflict and disorder was a product of class society which would end with its collapse. Anarchists tended to see order as arising spontaneously from the natural activities of humans (P.Marshall 1992). Some, like, political philosopher Eric Voegelin, claim that political order results from an experience of cosmic order as conveyed in symbols and, conventionally, consider disorder as pathological (Frederici 2003). Conflict theorists tend to see conflict as a failure of order, or as a means of maintaining, or applying, order (the order of stratification in Collins 1975, structure and personality in Ross 1993). Disorder thus tends to be reduced to an epiphenomenon or a 'glitch', either temporary or structurally threatening, rather than something which grows up with a mode of ordering, or which can be used politically to justify that ordering. Chaos becomes something to suppress or, in some management theory, something to embrace as a kind of order (e.g. Peters 1999; Pascale et al 2001).

ICT is sometimes factored into studies of governance as a tool of power. Even the sceptical writings of Gutstein (1999) and Saco (2002), assume that it is possible to build a corporately controlled internet and thus a corporately controlled 'democracy'

without pausing to consider how ICT use may actually undermine such intentions. Elsewhere ICT may be seen as a tool of 'freedom'. A common theory, especially by people using the term "distributed governance", is that ICT lowers hierarchies and necessarily increases freedom of action (e.g. Lenihan 2002, Friedman 2005). However, in classical bureaucracies, the lower levels or periphery were to some extent isolated from the apex and thus able to disguise their actions giving them some freedom to adapt to local conditions. With lower hierarchies (especially when all keystrokes and records can be traced, and the actor is confined by having to fit in with the options and checks provided by a computer program), there is less separation between the centre and the periphery, and less room for the periphery to move and adapt to local conditions, or to vary from control scripts, thus decreasing the ability of organisations to adapt, and increasing the amount of inaccurate information the centre will receive and use in planning response, thus leading to an inability to make decisions based on realities and to eventual collapse. In other words, the inequalities work both ways. People in power are protected from the truth by the excellence of regimes used to give them information, and thus information technology has a complicated relationship to power.

Another way that power can factor into the effects of technology goes back to the intention with which it is designed. Thus Marxists have long argued that technology under capitalism is primarily designed to lower the costs of labour and to make workers interchangeable so that capitalists are not dependent upon individual workers and the collective power of the workers is diminished. Clearly this could be the case even in non capitalist systems, all it requires is for there to be a disjuncture between those who own, control and design the technology and those who use it. In this case some kinds of 'disruption' to social order are designed into the system. Users find that they have less power, less social safety, less capacity to organise, are under greater control and surveillance, produce more and get paid less and so on; and this disruption to their lives is deliberate and part of the design. Ideally these users might then rebel and sabotage the systems, which produces further disruption, which the owners try to control by force and their law, as happened overtly with the luddites. (For some references see Marshall 2006: 2-3). Technology is often a form of social as well as technical engineering, and conflicts between social groups and within social groups are an important part of its environment, construction and implementation, and cannot be

ignored. However, as will be suggested later on, it is doubtful as to whether the 'ruling class' feel as if they are in control either.

Economics, Business and Disorder:

As previously mentioned, in Marxist thought temporary disorder produced is produced by class conflict. Thorstein Veblen changed the locus of conflict from classes to professions: to that between engineers and managers, or between technicians and "vested interests". According to Coser:

> Veblen argued that, far from being the fittest agents of evolutionary advancement, men engaged in pecuniary activities were parasites growing fat on the technological leadership and innovation of other men…. The 'captains of industry' made no industrial contribution and therefore had no progressive function in the evolutionary process; rather, they retarded and distorted it.

Veblen went on to argue that these different positions even produced different modes of thought: those in pecuniary employment thought in magical categories while those engaged in working with machinery had to think in more rational, matter-of-fact terms (Coser 1977: 266-8). It may be harder to allocate 'rationality' with software technology, but never the less differences of worldview may depend upon familiarity with certain technological processes. A new technology may challenge old institutions, and modes of thought, and evoke the resistance of those depending upon them. As an example, Veblen argues that the Railways of Great Britain where built with too narrow a gauge for their 'modern use' (in the early 1900s) and though "from the standpoint of the community" they should be junked, but it "is the discretion of the business men that necessarily decides these questions, and the whole proposition has a different value as seen in the light of the competitive pecuniary interests of the business men in control". As a result the railways were:

> improved, 'perfected', adapted, to meet changing requirements in some passable fashion; but the chief significance of this work of improvement, adaptation and repair in this connection is that it argues a fatal reluctance or inability to overcome this all-pervading depreciation by obsolescence. All this does not mean that the British have sinned against the canons of technology. It is only that they are paying the penalty for having been thrown into the lead and so having shown the way (1915: 130-2).

Here we have the suggestion that disorder arises from delay, or of social conflict between perfectly adapting engineers and stupid business people. While this is

consoling to the engineers (and we have seen the same exoneration is often given to programmers), and the problem of legacy systems cannot be ignored, what is actually implied is that the perceptions of disorder and disruption are socially distributed. To one faction disorder and disruption seems negligible, to the other it does not. The order which the engineers would like to impose as efficient, may at best only be efficient for them. What Veblen calls "conscientious withholding of efficiency" or an attempt to minimise production in order to get the best price return is perhaps a completely rational idea from a business point of view, as is manufacturing goods that don't last forever. It cannot be assumed that efficiency is non-contestable, or that rationalities do not compete. In many cases business has shown itself to be more in love with technology than the engineers – updating whenever possible even if not strictly necessary – and able to exploit systems which were intended for 'rational' purposes. However, this viewpoint still implies that if the engineers where not being interfered with by someone else then the systems would work perfectly, whereas I'm not quite so sanguine there is evidence that this would occur – 'legacy systems' would still affect what was practicable to be done, and what the engineers had learnt how to deal with. Starting from scratch may only be easy if there are no other systems involved, and few societies are that simple.

Furthermore this approach does not deal with the disorder which may arise from functioning systems. Global business systems (such as derivatives and forex markets), which only exist due to ICT and which are intended to produce order, may actually increase unpredictability through *adding* complexity, or by undermining conventionally necessary distinctions (Soros 1998: 187-91; Partnoy 2003; Millo et al 2005). The inability to completely order foreign exchange markets, for example, is a lever which allows the production of money through speedy exploitation of minute differences. Estimated turnover on the Forex markets is 1.9 trillion US dollars a day (of which 95% is speculative), and on derivatives is 1.2 trillion US dollars per day; dwarfing conventional trade and making the 'regular' economy parasitic on chaotic speculation or gambling (BIS 2004). What Malcolm D. Knight (2005), General Manager of the Bank for International Settlements calls "an unusual, perhaps unprecedented, combination of financial imbalances" cannot be ignored in a study of instability in ICT and World systems. Palan (2003) points to the deliberately chaotic nature of the 'offshore world', defined by its exemption from taxation and regulation,

as an important part of modern business and a major way of exploiting differences in order or laws. The ways that contemporary capitalism requires these places outside the law in order to function, at the same time allows those groups which are hostile to it to finance their own operations and disrupt its functioning (Robinson 2003). The disorder of war may allow governments to subsidise their favourite companies, such as Halliburton, without there being too much concern about where the money went – the confusion seems natural. However, despite recurrent market instability, volatility, the exploitation of chaos and the collapse of large numbers of businesses, most economists still use a variety of equilibrium theory and see disorderly processes as temporary (Ormerod 1997, 2005).

What capitalist economists generally imply is that the 'invisible hand' of the market produces a rational, or optimal, equilibrium system whether individual choices are rational or not. What is alleged here is that it is probable that in a sufficiently complex, interlinked and fast system even individually rational choices will produce what appears to be irrational results, inefficiency and instability. At it should be remembered that if a field becomes a desert, it may then it may have reached equilibrium.

The main recognition of order as a mode of disorder has usually been proposed in supposedly humorous books and thus largely ignored by mainstream economic and management thought, or held to only (magically) apply to government administration. Thus Parkinson's various laws ("work expands to fill the time available", "officials multiply subordinates", "Expenditure rises to meet income" [Parkinson 1958, 1960]), the Peter Principle ("in a hierarchy every member tends to rise to their level of incompetence" [Peter & Hull 1969]), Celine's Laws ("National Security is the chief cause of national insecurity", "Accurate communication is possible only between equals" [Wilson 1980: 118-25]), Systemantics ("New systems mean new problems" "Systems tend to oppose their own proper functions"[Gall 2002]), or even possibly the Dilbert Principle (which is hard to summarise but might be phrased as management selects for stupidity in managers, who then make work complicated wasting worker's time, in order to have something to do, to display their power although they have little real power, and to show those superior to them that they deserve promotion [Adams 1996, 1967]).

As a sidenote on Parkinson's Second Law, Nicholas Rescher suggests that management tends to bloat, not just because mangers appoint underlings, but because the more complex situations become the more checks, controls and information gathering are required (1997: 177). In other words, the more efficient information technology is, then the greater the swelling of management. Even governments who claim to want to reduce bureaucracy end up spending more on management despite the cuts in the services they provide for ordinary people. Indeed they often more and more trying to make sure that the benefits are not exploited by the 'lower classes' or 'undesirables' with ever diminishing returns, and making it harder still for people to obtain legitimate help.

In general, any description or modelling of a human organisation (or any thing else) must ultimately be incomplete or inaccurate, and thus somewhat disruptive. Sometimes this incompleteness does not seem to matter, but usually humans deal with the inaccuracies in their models by constant adjustment, approximations, tacit non-explicit (or unconscious) knowledge or feelings, and failure. Computers (at this stage) can only deal with the system by the explicit knowledge provided through the software, and hence failure becomes more probable. When Computer networks provide the model, there may be further resistance to these human adaptations, as they were never considered in the software. Furthermore the officially optimal solution (fitting in with power and deference structures), may in practice have never worked – now it is the only solution which is allowed.

Rescher also suggests that technological solutions will always engender new problems which will call for further technological solutions, so that human artifice is automatically embedded in a "complexity tropism" (1998: 174), until the technology becomes too complex for human management. Thus he thinks it plausible that the growth of new problems "systematically outpaces" the growth of solutions (ibid: 179), producing what Thomas Homer-Dixon (2000) calls the "ingenuity gap" which can lead to further disruption. As computer systems widen our sphere of action they thus augment the complexity that is faced, and in a situation requiring organisation or management this difficulty then requires some control. Rescher even suggests that with computers there are potentially exponential increase in complexity (ibid: 180).

This complexity may mean that consequences can never be fully tested. As an example:

> Roger S. Pressman pointed out in his book *Software Engineering*, "exhaustive testing presents certain logistical problems.… Even a small 100-line program with some nested paths and a single loop executing less than twenty times may require 10 to the power of 14 possible paths to be executed." To test all of those 100 trillion paths, he noted, assuming each could be evaluated in a millisecond, would take 3170 years (Charette 2005: 47).

At a more obvious level, it is probable that the capacity to produce information, especially information about information, coupled with the fear of loss of local knowledge, leads to the demand that information be produced and collected; which then disrupts people's ability to do the work which is the basis of, and justification for, that information. Data-bases become increasingly detailed because they can be. This factor of increasing an existing tendency we can call intensification. Some people even seem to posit that interconnections alone lead to intelligence, rather than to people becoming lost (Kelley 2006). Intelligence involves forgetting links as well as emphasising certain ones, and a system can only be intelligent if it can be disrupted and adapt to that disruption. More is not always better.

Thus, a way of solving problems, and creating order, creates new problems. This is further intensified as information technology is frequently treated as if it was magic and its installation will solve all problems. As Knox et al report (2005), it is common for people in business to express scepticism about ICT systems, yet to keep that scepticism to themselves, to publicly relate ideal narratives of success, and for the business not to do a review to see if the implementation indeed saved money and increased efficiency. Managers will frequently claim such evaluation is not possible, yet will embrace ICT enthusiastically, knowing it must work. The figures provided by the technology seemed frequently without meaning, and people had to investigate and make those meanings. Calculative rationality was impossible. Knox remarks that:

> the constant limitations and difficulties in ensuring the ideal functioning of the logic of information systems to produce knowledge and value are inherent to the continued pursuit of knowledge… because they create the circumstances in which different kinds of expertise are performed, and knowledge as a culturally and performatively relevant concept becomes re-established as important.

The way people bring the unknown, the unpredictable or the chaotic into conceivability, so that they may act – especially when that action is within already established frameworks and relations of power and knowledge based status, produces connections which elsewhere, or later on, will seem to be 'magical' or 'irrational' (Marshall 1992). If this is the case, then we might need to explore how to remove the self validity of these perceptions and conceptions, and enable productive creativity and problem solving. These initial 'magical' phases need to be taken into a second more 'logical', 'critical' or technical phase. Traditionally western theories of innovation have tended to focus on one of these phases rather than both.

Section 3: Disorder, Distributed Governance and Cyborgs

The problem of disorder and order arose for me, during investigation of social control and gender on the Internet Mailing List 'Cybermind' and the paradoxes of the information economy (Marshall 2000, 2003). Despite claims of arising spontaneous order, and even semi-authoritarian structures, life for the people studied seemed fractious and overtly chaotic. Order was not easy, and was often paradoxical in that efforts to maintain the list could also undermine it. Methods of preventing flame wars could start them, methods of maintaining community could fracture it and so on (Marshall forthcoming). People frequently expressed feelings of loss of control in their daily lives, often centred on computer technology, an alienation and hopelessness about 'real world' politics, a feeling that power was elsewhere, and that they were outsiders or subject to forces beyond their ability to affect. Politics also formed lines of fracture, despite common academic arguments that politics would become more democratic, discursive and empowering when using ICT.

Political alienation and helplessness could easily be explained by the hypothesis of the increasing dominance of the corporate sector: the ways that, in the 'new economy', corporate interests are taken as universal interests, and in which political actors seem dependent upon the corporate sector for funds, or for media publicity and support. This is the usual reification of the economy as a separate and real force which conditions reality, with a ruling class interesting in making the participatory and potentially helpful state impossible. This impersonal, or class based, corporate economy could be held responsible for the competition which workers face with those overseas which lowers their salaries and equally responsible for the competition for good managers with those from overseas, which is held to increase executive salaries. This is an easy explanation, but there are problems with it. Garten's interviews with top CEOs (2001) shows that they do not feel in control; Lapham's (1998) account of a Davos conference also displays our leader's confusion. The recent massive collapse of companies such as Enron, or HIH also imply that financial control, or gaining State support, is more difficult than might be expected in the corporate dominance model. Furthermore it is a constant refrain of those who support the politics of corporate ascendancy that they do not feel in control either. Such facts suggest that the

experience of confusion and chaos is systemic rather than class based or relative to one's use of, or familiarity with, the technology.

The first writers I am aware of, who attempted to deal with the spread of these issues were Negri and Hardt in their books *Empire* (2000) and *Multitude* (2004). In terms of comment aroused, these books may be the most successful academic analysis of the contemporary world in the last twenty years[1]. Hardt and Negri argue that the world is now governed by what they call 'Empire'. This is an unfortunate term and has lead to an eruption of argument about whether the USA constitutes an empire, which is irrelevant to their main point. By Empire they mean that in:

> contrast to imperialism, Empire establishes no territorial center of power and does not rely on fixed boundaries or barriers. It is a *decentered* and *deterritorializing* apparatus of rule that progressively incorporates the entire global realm within its open, expanding frontiers (Hardt & Negri, 2000: xii).

Negri defines Empire as "the transfer of sovereignty of nation-states to a higher entity", but not to a World Nation, or to an existent nation like the United States (Negri 2004: 59). It is "a network power" (Hardt & Negri 2004: xii) dependent on ICT. It "takes form when language and communication, or really when immaterial labor and cooperation become the dominant force" (2000: 385). Governance is distributed and no longer has clear outlines. The implication that there is no longer a fulcrum point for control, helps explain the diffusion of feelings of powerlessness. That the US has dominance, does not mean it has control, and attempts to assert such dominance may undermine it, especially when modern military technology means that it is much easier to attack than it is to defend – i.e. to produce disorder than to produce order.

There are, however, significant problems with Negri and Hardt's position, about which I have written three interconnected conference papers[2]. They tend to use a rather sunny version of information society theory (ultimately derived from yet more optimistic than Toffler 1980, 1990), implying that the Internet is inherently radical, that information workers, or immaterial labour, (across the world) will easily unite, that extended co-operation between different workers will foster socialism (co-

[1] For example Abu-Manneh (2003), Balakrishnan & Aronowitz (2003), Passavant & Dean (2004), Boron (2005).
[2] One of which has appeared as Marshall (2006). .

operation is no more socialism than trade is equivalent to capitalism), and that the human embedded in technology (or the 'cyborg') is necessarily radical and powerful.

The term 'cyborg' points to a set of ideas about humans, hybridity, computers and the social organisation of radicalism which has been developed out of Haraway's famous paper on cyborgs (1991), which still has enormous influence on visions of the future, not just in the academic world. The metaphor of the cyborg implies some kind of distributed, de-centred, governance or contacts between people. However, ideas of boundary crossing and automatic hybridity are not necessarily 'liberating', but can easily be subsumed into a totalising ICT system which does not recognise boundaries, or independence, of any sort. Such a system has the potential to incorporate most forms of human life, and subject them to the implicit politics of its data categories or to unpredicted feedback and chaotic demands. If disorder is implicated by ordering, then the boundaries broken may be those necessary for more local democratic orders. Democracy may depend on a degree of tolerance of chaos, and an ability to establish boundaries around oneself. Furthermore, as Kallinikos (2005) suggests; if ICT systems add complexity and connection, then they almost inevitably sabotage standard modes of organising which depend upon simplification and boundaries.

The most obvious 'cyborg bodies' with which people have to contend are their computer records, which may be hidden and accessed without their consent or knowledge, and which can dramatically affect their lives. Disruption can arise here from what Henman (2003) calls 'targeting', or the ways that people have to be forced into categories in order to comply with the requirements of the data processing system. While such categorisation assigns worth, risk and treatment to people, and dictates business behaviour, it may not reflect the more complex reality. People, who resemble offenders in a constructed category, may end up as much the focus of government in time and money as those who do offend, and their behaviour may alter in unexpected ways as a result. Governments are also increasingly using ICT to 'cut red tape' and to give back 'responsibility' to their 'clients', yet these programmes may not have their intended effects due to targeting through inappropriate categories, and this may be inevitable given the modes of implementation. Such encounters lead to feelings of resentment and disempowerment rather than of responsibility, and governmental records can become increasingly disconnected from life as hypothetical categories are

reinforced by use, which further adds to experiences of disorder and inefficiencies in the undertaking of governance.

Despite such objections to the optimistic trend of Hardt and Negri's argument, their main ideas of distributed governance and the deferral of responsibility, points towards the complexities of modern organisation and its relation to ICT, and needs further elaboration.

Looking at the disorder(s) produced can tell us something about the functions of order. To uncover this disorder we have to look at things which are generally ignored or swept under the carpet in the name of smooth functioning, or which are hidden by strategies developed by the users, so as to deal with the complexities the system will not admit or which it generates. ICT by structuring patterns of communication and information processing, also enables and restricts certain types of social behaviour, which may not be those expected by the implementors. It may also structure the way people can behave, or the ways they will be recognised as behaving.

Section 4: Preliminary Theoretical Conclusions

Let us first state what this study is not proposing, or attempting.

This study is not an application of chaos theory to ICT, partly because the aim of that theory seems to be to find, what science writer John Gribbin (2004) calls "deep simplicity", or the order underlying chaotic appearances, rather than exploring the mutual relationship between humanly defined order and chaos. However, features of chaos and complexity theory, such as the significance of initial conditions, history and feedback loops have been recognised as important to the kinds of disorder produced. In terms of complexity theory, it is hypothesisable that some disorder arises because of conflicts between the social behaviours or organisation emergent from the workers and users, and the more top-down command organisation imposed by ICT. In societies with a long history of equilibrium, these two orders *may* appear indistinguishable, but given the rarity of such equilibrium in the modern world, this mutuality is elusive, with disorder and unresolvable conflict the result.

The study is not a humanistic attack on the deficiencies of the internet as a mode of relating, ordering knowledge or building trust (such as Birkerts 1994; Talbott 1995 or Dreyfus 2001). I assume that technology both enables and restricts, and that it is pointless to portray what it enables as a failure when it generates what might seem like inadequacies from another perspective. The study focuses on ICT, not only because of the researcher's background in ICT research, but because anecdote and experience suggests that people frequently perceive ICT as a source of disruption which attempts to restructure their work and life in ways which were presumably not anticipated, even though the disruptions seem to have recurrent patterns.

The focus is, uniquely for a study of governance, upon the experience and creation of disorder. The prime conception is that networks are social systems and that social systems cannot be ignored as they form the basis within which ICT acts. These social systems are underpinned by formal and informal organisations of both communication and technological systems, together with modes of knowledge about those systems, which are distributed (and different) throughout the system. These organisations of

communication specifically enable particular uses of power, and particular divisions of people into groups. These divisions are not extraneous to the system and to be ignored when implementing a new system of communication if the new ordering is not to be disruptive of past functions, and not to generate resistance and disorder.

In contemporary organisations, local and world wide, ICT plays an increasingly important role in furthering modes of ordering – either political, corporate, 'civil' or terrorist etc. Observation and experience suggests that these forms of ordering produce forms of disorder, which are sometimes used to justify further orderings, and which frequently conflict with either the results demanded or the lives that people lead.

There may also be socially placed differing views of order which drive the chaos/order configuration which arises, and we may need to research competing dynamics of ordering, the points from which chaos is defined and the politics of that defining[3]. Views which separate out chaos and order into discrete universal entities on which everyone in a social field can necessarily agree, retard the study of society in the same way as the assumption that 'culture' had to be shared by everyone in a group. Nowadays scholars are more likely to accept the existence of competing ideo-cultures tied in with power relations, rhetoric, and interpretations (cf. Barth 1993). Differing interpretations and distributions of culture are part of the social dynamics driving culture, as are differing interpretations and distributions of the chaos and order complex.

To summarise. ICT produces order and disorder in the following ways, many of which are related:

1) Incompatibility with, or disruption of, social organisation

i) ICT structures communication and thus affects social organisation. If this is not realised then chaos can result. Most of the social models implicit in the technology are imposed top down, without any investigation of social organization and group interactions. These imposed models rarely emerge from the user's lives and are thus even less likely to be accurate.

ii) The structures set up can be based upon inaccurate models of social organisation, even if the users report that they are organised in that particular way. The social models and categories in the ICT, or software, may ignore actual social divisions, connections, collaborations and competitions, and thus be sidelined by them, or it may attempt to impose social models and categories which serve one group rather than all, and be caught up in resistances. Social groups will have different interests and this will affect their responses to the ICT and the ways that it should be implemented. These differences can occur within groups that look uniform from the outside.

iii) Issues of hierarchy, authority structure and blame can stop the reporting of doubts about the ICT or implementation up the management chain – no matter how 'horizontal' it is.

iv) ICT can concretise social conflicts, which would have passed, by fossilising them in the software. It can render some people disposable and they may object.

v) It can allocate risks and costs in ways that people may consider unfair, or which may protect certain people from feeling the consequences of their actions and thus intensify those actions. Similarly it may dump rubbish and garbage on certain people who previously did not have that happen to them.

vi) It can produce new rivalries as people attempt to take advantage of the new political and communication structures it sets up. Some may benefit from the disorder produced in other people's lives.

vii) ICT may break boundaries which allowed particular procedures and senses of self identity to work. A local operation may now lose its independence to a distant centre.

viii) ICT may also change the mechanisms of communication, and thus change communication and its relation to power, by demanding new expertise and new types of persuasion.

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[3] This realisation might be implicit in Robey and Boudreau (1999), but it is certainly

ix) ICT can shift attention, making some things which are important to the social process or the actual work vanish, and intensify others. This can cause loss of local knowledge and the application of generalisations which are untested in this new situation.

x) ICT can distribute governance making it unclear who should take responsibility, who should check, and who should initiate actions. This can lead to things not being done, or actions not being followed up.

2 Data Categorisation

xi) ICT demands that reality be categorised in particular ways so that data can be entered into the system. This categorisation may be hard to apply realistically. Such categorisation may always have to depart from reality due to reality's complexity. Humans normally fudge and judge ways of categorisation depending upon context and their intent at the moment rather than aiming for uniformly. Bad, or limited, categorisation can cause conflict with the people or events which are being so categorised.

xii) The form of categorising known as targeting attempts to predict the behaviour of people, or other things, based upon the way they have been categorised, or by the various properties which they allegedly have. Again this may mismatch with reality, or even produce the effects that it is trying to defend against, or anticipate.

3 Complexity

xiii) ICT adds complexity – in particular it may add unnecessary complexity.

xiv) Complexity can make it harder to repair things or to understand them.

xv) Complexity can increase the demand to do more. It can lead to extra work – more data can be captured, documents can be improved or changed infinitely, people can be subject to higher degrees of scrutiny so that previously trivial actions can be caught

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not explicit.

and punished. Standards of data and of entry which were previously acceptable may no longer work. This can intensify situations. It can make it easier to apply the idea that if some of something is good then more of it is better. It is possible that some intensifications can lead to violent inversions, or enantiodromia.

xvi) Complexity changes the relative balance of the importance of things, so that things which *must* be done, can be snowed under by things which *can* be done. Rare actions can be made easier to take with the consequence that normal actions can be made harder to do. People may waste time with trivialities.

xvii) ICT's complexity adds new feedback relations. Errors can accumulate faster than they can be detected. Previously separated parts of the system can unexpectedly interfere with each other. Chaotic effects can travel further and are not confined to a small part of the system. Things which were previously separate can be brought together and interact in unexpected ways. This tendency has been called 'interlinkage', 'coupling' or 'apraxia'. It is intensified by speed.

xviii) Complexity may mean that problems compound. Small problems, non of them serious, are now able to interfere with each other. They may prevent previously easy solutions of the other problems.

4) Technological-Managerial-Historical

xix) Legacy technological and social systems may influence what can be done, or what will be resisted or disrupted. Changing one legacy system may produce unexpected failure elsewhere.

xx) Once a system is established people will 'reverse adapt' to it, building social structures around it. These social structures may involve tacit, implicit local knowledges of how to get things done, systems of fudging, and expertise, which are largely unsystematised and invisible to management, or others not immediately in the system. These systems can be disrupted by attempts to improve, or otherwise change, the explicit organisation with unexpected consequences.

xxi) Ways of implementation may also cause disruption. Thus the reluctance to spend enough at the 'right' stages can lead to unequal development and incomplete program sections. Yet it is uncertain that these costs or stages can always be predicted in advance. A need to have the system implemented quickly can lead to little investigation of what needs to be done in different parts of the organization (assuming needs and perception of needs is uniform throughout the organization. Deadlines can also imply that testing is not carried out, and thus increase the inability to predict side-effects. The system can implemented in deathmarches as a result of unrealistic deadlines, inflexibility, allocation of expendability to programmers etc.

xxii) Not everyone in the organization will perceive the disorder, and thus there may well be struggles over whether disorder exists. Others may find the disorder beneficial, or it may increase their chance of increasing the disordering order to fight the disorder.

xxiii) Technology can be perceived magically, as if it in itself had the answers to problems, rather than being a tool which can create problems.

Simplification

These points can be further simplified in to some directives, which will perhaps not allow the avoidance of disorder but will help in analysing where it comes from.

a) Look at the conflicts, differences, incompatibilities of interests of the social groups involved.

b) Look at the relationships between the technology and the social groups and social systems involved. Informal systems, systems of fudges, establishment of boundaries.

c) Look at how changes in method and structure of communication will affect those social groups.

d) Look at the ways the technology tends to interlink, intensify and compound work practices.

e) Look at the way the new ICT enables or restricts change in work, privilege and power differently for different people.

f) Look at the way data and people must be treated by, or presented to, the system.

g) Do not think that because people intend something to be ordered that it will result in ordering without disorder, or that by allocating blame you are explaining the result.

Finally we can state that if a technology is complex in itself, the system becomes still more complex when the social linkages between humans are added.

Section 5: The Customs Software Installation

The Australian Customs implemented a new system for managing cargo which effectively went online in late 2005. It was widely reported to have massive cost blowouts, have run wildly over time, to be bug ridden, to be slower than the system it replaced, and to be a spectacular failure with cargo piling up on the docks during the pre-Christmas rush period. It was thus a fairly standard bad software implementation, and responses to it, and proposed solutions, were also fairly standard. If the reader is primarily interested in the recommendations, which are made after the study, then they should read section 6 onwards.

This study is very much a provisional attempt to make sense of the recurring features of an example of ICT imposed disorder, and to take as much notice of the social groups involved as it is possible to do when only reading reports. It does not claim any definitive accuracy and I would appreciate readers pointing out errors. It was frequently difficult from newspaper reports to infer when something actually occurred. During the course of telling the history, I shall try and extract recurrent features, group demarcations and regular disruptions which were identified in Section 4. Initially it could be suspected that the groups would involve: Customs brokers (big and small), software companies (involved and third party), programmers, Customs management, and Politicians from either side of politics. Due to the nature of the reporting I observed it is almost impossible to give programmers a voice or to discuss the many technical issues which must have impinged upon this project. It is thus impossible to discuss the 'different modes of thinking' which Veblen has led us to expect might be present, and to compare them, or look at the ways they clash. It is not possible to say how much the deathmarch syndrome was in action, although it seems probable it was. It is also largely impossible to describe the politics of the hidden models in the software, and the ways these might have been exploited by various people. Some might argue that such an absence of the technical in this discussion should stop me from pontificating on the issues involved, but this has not stopped anyone else.

Customs' previous integrated cargo control and clearance computer system, known as 'Compile' was up and running by 1986 (Mentions of it occur in the AFR 8 April 1983:

14; as forthcoming in 8 January 1986: 7; and as if in action in 10 June 1986: 74). New systems of "integrated cargo control" were being proposed by September of that year (AFR, 11 September 1986: 7). This new system appeared to centralise operations in Sydney and Melbourne and drew strong opposition from other States, particularly from people in Brisbane (AFR, 13 October 1986: 27; 6 November 1986: 5). This at least established potential conflicts with the States as part of the environment and the necessity of avoiding the appearance of preferred treatment.

Later in 1990 there was more talk of improving Compile and the possible use of the non-profit consortium Tradegate System which had been set up by August 1989 and soon gained 2,000 users (AFR, 21 August 1989: 58; 27 November 1989: 52; 5 December 1989: 35; 17 December 1990: 21). Unisys won a contract to improve the system over a five year period from 1991 and immediately started to transfer the system from an IBM mainframe to a Unisys mainframe (AFR, 1 August 1994: 30). This in itself while sensible from Unisys's point of view as consolidating their power and expertise also had the potential to be disruptive as it introduces new elements to the system. In March 1992, the Australian National Audit Office found security, and accounting procedures were inadequate in various customs systems and recommended that they be altered (AFR, 30 March 1992: 36). This also suggests potential conflicts within Government about what a system should do.

The Compile system had a major crash in August 1993 (AFR, 9 August 1993: 35), and the Exit system was reported to have crashed regularly after February 1994 when "Unisys began converting the EDI (Electronic Data Interchange) Gateway for electronic reporting of export manifests". Apparently there was a conflict between the EDI system which ran on Unix and the Tradegate Network (AFR, 1 August 1994: 30). Here disruption is clearly explained by difference between systems, although difference in ownership of systems is probably of some import as well. In any case there is also an apparent change intended in the structure and mechanisms of communication, and thus in the social system around the computers.

A Cargo Management Strategy may have been announced, or begun to be investigated, in April 1996. It had three major strategic directions: closer links with clients; greater cooperation and coordination amongst government agencies, and; an integrated cargo

system (BAHR: 7). This might be referred to as conventional and approved managerial goals. The proposed Integrated Cargo System (ICS) was first announced in April 1997 (Newsbytes, 17 April 1997), as was the full outsourcing of all Customs IT requirements to EDS (a Texas based Company) in December of that year, with the hope of cutting costs (John Fahey, Media Release, 22 December 1997). This outsourcing probably had negative effects on the capacities of customs to regulate programming, and on its knowledge of the systems which were currently in place, but accorded with the government's view both of reality and the efficiency of the corporate sector. The Office of Business Systems was formed in March 1998 to undertake a review of existing business systems and processes (BAHR: 7) and obviously to help good management.

EDS became responsible for the ICS and the Customs Connect Facility (CCF) which was to link industry to the ICS and supersede Tradegate, the hub of which had been operated by "APPT subsidiary and internet services specialist connect.com.au" (AFR, 25 June 2001: 41). This promoted potential conflict yet again. Amidst rumours that EDS was unable to complete the project by 2002 and had overcharged, Customs brought in other companies to do the programming and EDS withdrew its personnel from Customs (Mills 2001). This further split control, and created possibilities for confusion and lack of knowledge.

The ICS was to "replace about nine legacy systems, plus a web-based communications gateway" (AFR, 20 May 2003: 36). The new consortium was lead by Computer Associates and was supposed to finish the project in 17 months by July 21 2003, a legislative deadline. Peter Earlam, the general manager of Computer Associates was reported to have said "It is a tight deadline but we've had a pretty close look at it and we are confident it's achievable" (AFR, 13 February 2002: 41). This prediction proved false, and extensions were being sought by April 2002 (AFR, 30 April 2002, 33). EDS was kept on as the outsourcer for all other projects, apart from telecommunications infrastructure, to maintain stability.

A new CIO (Murray Harrison) was appointed for the new information and technology division (AFR, 25 June 2002, 33: 11 September 2002: 55). Thus 'management ownership' was allocated. The overall project was to be called Customs Management

Re-engineering (CMR), with the Integrated Cargo System (ICS) at its core. The Customs Connect Facility (CCF) was the gateway to Customs' business applications and was to be accessible by Customs Interactive (CI) using Web services or by batch mode EDI (Information Age: 14/02/2006 11:26:31). Concerns after the attacks on New York in September 2001 lead to attempts to increase security through "state-of-the-art container X-ray facilities at shipping ports around the country, ramping up mobile X-ray capabilities and research into new technologies that can better detect the contents of containers, such as nuclear detection handheld devices [and a] passenger analysis clearance and evaluation system" (AFR, 1 April 2003: 36). More and better control was being demanded, and this would eventually lead to greater disruption and disorder.

The first testing was announced in October 2002, amidst criticism from the operators of the existing Customs system, and from Tradegate, who claimed that the new system would penalise middle range businesses. This establishes the recognition of potential differences in businesses response to the system. Neil Perry, general manager for e-commerce at Connect Internet Solutions claimed Customs treatment of Tradegate was cavalier and noted that Tradegate was supposed to be Customs backup for the new system, but the Tradegate/Connect network might not wish to continue to offer the service to Customs (AFR, 15 October 2002, 31).

By March 2003 customs negotiated a new contract with Computer Associates and pushed back the deadline for the final release of the system to June 2004, which left it only a month before the new legislated deadline was reached. "The changes to the timetable are simply to allow for traditional testing and development of what is a highly complex system change", a Customs spokesman said (AFR, 11 March 2003: 31). "The CCF module went live in April of 2003" (BAHR: 9). Also in April, an interview with Customs CIO Harrison was quoting him as wanting "to take on more of a disciplined project management methodology around IT projects" and prevent outsourcers from simply doing their own thing. The new "methodology now requires project managers to build the corporate requirements of their project into the business case, which they must then report against as they go". The ICS was "priority one, two and three". Harrison is making all the required gestures towards "good management".

By late May of 2003 the cost was supposed to have jumped 40% to $41 million but it was still expected that "end to end" testing could occur by June with the export module going live in December. People were also requesting an equal time to test the import module which was agreed to be "the most complex piece of the new system" (AFR, 27 May 2003, 33). By August it was reported that the Government was being pressured by the federal opposition, industry groups and software developers for a second extension to the legislative deadline as the export module had been released two months late. According to Richard White chief executive of software developer Eagle Datamation International the tight deadline had resulted from the complex nature of the work and the compressed timeframe had heightened risk of failure (AFR, 19 August 2003: 27). This is conventional management wisdom and order in response to incoming deadlines. In September it was reported that:

> Australia's exporters are in wholesale revolt over the Australian Customs Service's ICS (Integrated Cargo System) software amidst claims that both IT vendors and Customs are attempting to push a version of Release 2 (R2) of ICS that is so untested and severely bug ridden that it is inoperable.

One user was reported as claiming "The current ICS release is many, many times worse than...any first release of any prior Customs EDI system" another said "You can't expect us to test if our systems work with it if they can't even get theirs to work. They need to get it into their heads it doesn't work" (Computerworld 26 September, 2003). As a result the same magazine reported that Customs ordered "participating IT vendors to put the stabilisation of the current release ahead of further development of the system". Customs took the required modular approach. It did not sacrifice people to a big simultaneous installation, and it patched up the faults as they became visible.

It was also alleged that different vendors had to talk to each other through customs (ie customs wanted to control what was going on) and that the deadlines were resulting in staff abandoning the work (Computerworld 03 October, 2003). So again an aimed at order was disruptive.

At the end of October Customs agreed to ask for an extension and to remove clauses which would punish their IT vendors if the project missed the July 2004 deadline. Computerworld argued that "Trading and transport industry insiders are hailing the delay of the ICS as a victory for commonsense, arguing any further attempts to force

unfinished code onto users would have created a software disaster area" (20 October 2003). A 12-month extension would be a preferred option for industry groups, including the Customs Brokers & Forwarders Council of Australia. However an October press release on the UNece site claimed that "The export reporting component will be in place by early 2004, while the import reporting component will operate from the middle of 2004" which suggests Customs was ignoring people, or at least split in its announcements or internal ordering. The release also claimed "An integral part of the development of the ICS has been a strong consultative program with industry involving information exchange, seminars and 'road shows' throughout cities and major regional centres in Australia". Paul Zalai, freight and business operations manager of the CBFCA said "To date, the CBFCA has not been consulted on any deferred release dates" (AFR, 21 October 2003, 31), yet clearly Customs was listening to somebody, or else the extension would not have occurred. A group fracture, possibly hidden from Customs, is in evidence. Customs is taking a varied and conflictual group as being uniform.

The problem over the system did not go away. The AFR reported in advance that a Senate committee would hear that "development costs have ballooned out to more than $80 million at least $17 million more than planned and the completion date is likely to be two years later than planned" and that "the department has begun negotiations with TradeGate, the industry group that operates existing electronic links, to extend this service beyond July". Further reports claimed that the new electronic gateway, which had to support up to 2500 simultaneous users, could not "yet cope with 32 at the same time". Claims were also made that Customs IT staff left customs when their work was outsourced to EDS in 1997, so that customs had few people with any real knowledge, and that documentation of the earlier systems was missing (AFR, 3 November 2003: 59; 25 October 2005: First 29). At the committee meeting Lionel Woodward, Customs chief executive, said that two key systems developments (one from Computer Associates and the other from IBM) were expected to cost $145 million although the original estimate was $25 million to $30 million (AFR, 5 November 2003: 3). The date was altered and the Government announced it would "not push ahead blindly… because industry users have not enough time to prepare". Bob Wallace, director of the Customs Brokers and Forwarders Council of Australia responded: "We can handle CMR whenever it's rolled out. Industry is probably the most flexible player here".

Later events might give a different complexion to this claim, it at the least proved somewhat over optimistic, but it fits in with general views which oppose government and business – even when the government is using business to do its work. Customs claimed to have addressed 80 of the 130 problems detected in testing to that date (AFR, 2 December 2003: 31).

The Government had to give Customs "an urgent $43 million cash injection to cover a funding shortfall", amidst continuing complaints by third party software developers producing interfaces for users. One stated that "This is a very tough project because they are trying to go for the IT big bang of replacing everything in one hit. It is a risky approach from a project management point of view because if something is wrong in its core, then it is not just one system that will fail but the whole thing". This view which may not have been accurate could be disputed, as it is sometimes alleged that incompatibilities between systems which have to work together cause most of the problems. There is always an alternative way of allocating blame.

Delays were confirmed to give people more time. "Mr Woodward announced this month that the March 1 changeover date had been deferred indefinitely and that Customs had adopted a new approach. 'Customs will not announce a new changeover date for the ICS export component until Customs and key software developers are confident of the system's reliability', he said" (AFR, 30 December 2003, 1). This was seen by some as giving industry software developers an effective power of veto over cut off dates (Computer World, 18 May, 2004), and is some evidence of consultation. Soon after Murray Harrison of Customs denied there was a crisis "The way this has been reported is that the sky is falling in… This is a huge IT project (but) the sky is not falling in". The agency had underestimated the time needed to integrate the system, which involved 15,000 pages, 9000 business rules and 40,000 concurrent users, but nevertheless the project would be ready well within the new deadline (SMH, January 6, 2004). By the end of January 2004, Version 3 of the software was delivered to developers for testing amidst claims of persistent problems resulting from early decisions and bad Vendor Management. Customers Minister Chris Ellison met with software developers and industry groups (SMH, January 27, 2004). Discussion seems to have been largely about the financial burdens to importers, and to objections by Coles Myer, Du Pont and Patrick International Freight to a new category of importers

and exporters which was created by the software. Sadly what this category might have been undermining from their social organizational view is not reported – although it might have been the freeing of smaller businesses from their control. Reports also indicated that the software was not functional if subject to high levels of multiple use. It "could only handle 20 concurrent users before it exhibited serious performance issues (or crashed completely and required a lengthy system recovery). Thousands of companies will need to be able to use this facility when it goes live" (AFR, 10 February 2004, 53). Testing was presumably not happening on the right scale.

A Senate expenditure committee was told by Customs CEO Lionel Woodward, CIO Murray Harrison and ICS chief Jenny Peachey, that "'large slabs' of the $43 million emergency funding" would be devoted to the ICS project, that costs were to be passed on to vendors through an import declaration processing charge. This would eventually lead to conflict over the distribution of costs. The committee was also told "that a 'major contract variation' between the IT vendors hired to develop ICS for Customs had impacted the project to the tune of around $15.4 million dollars, especially as the project was 'completing'… for the 'final part, all the code is cut now for the ICS development. It's in product test that final part'" with the end of April or early May 2004 as the nominated date for the 'rollout'. The paper commented that the "May code release date is at variance with earlier statements from Customs that code cutting would not be rushed to meet over-ambitious deadlines" (ComputerWorld, 17 February 2004). Conflict over deadlines and cost, is not unreasonable, but these conflicts may disrupt the software construction, and then disrupt the systems which are being protected by the objections.

By May Customs was obviously expecting further delays as they extended their relationship with Tradegate until June 2005 (AFR, 14 May 2004, 70). This occurred despite Murray Harrison claiming that "the team has met its targets since a new development consortium took over two years ago" and that the export component of ICS would go live in the first week of October, with a two week bridging period from 22 September. As targets can only be measures, not the reality they measure, they consequently may disrupt things themselves, by making differences between actions and realities.

It was further planned that small users, connecting to the ICS over the internet and the Customs interactive web applications, were to be charged only the cost of the digital certificate required to carry out a transaction – about $180 for two years. High-volume users were to pay $10,000 a year to connect directly with Customs, plus the cost of digital certificates (The Australian, 18 May 2004: 1 – Preprints, C01). This may reflect back on the 'new categories' that Coles Myer, Du Pont and Patrick had objected to. The usual routine nowadays is for big business to pay less, or relatively less, than small businesses.

Workshops to help people comply with the changes were being announced in June (Weekly Tax Bulletin [ABIX Abstracts], 25 June 2004: 1036). By September it seems many users had not gained their certificates. Nicole Cottrell, of Australian Customs was warning that many had left it too late for the deadline. It was expected that many freight and export groups would have to access Customs via bureau services such as Tradegate (Lloyd's List Daily Commercial News [ABIX Abstracts] 16 September 2004: 5).

Much later it was to be reported that the export module "was implemented reasonably successfully…. The industry adapted to the system with little trouble (BAHR: 4). The BAHR claims that the module was first implemented in August 2004 (p 4) and in October 2004 (p9).

At the same time as all this was happening, Customs went to using internet phones, and "migrate[d] all 4800 personal computers on its nationwide network to a thin-client architecture as a central component of its just-signed $193 million contract extension with IT service provider EDS" (Australian, 17 August 2004: 1 - TC, 35, cf ComputerWorld 23 August 2004). Another tender was called for "scoping work for the retendering of all of the organisation's information and communication technology requirements" (AFR, 14 September 2004, 31). The idea seems to have been to try and replace mass outsourcing through one company (EDS) into smaller companies. "Customs is seeking a company that has a fully defined and documented methodology that is proven in the marketplace to assist and supplement internal resources to establish a baseline for its ICT requirements now and into the future" (AFR, 17 September 2004: First, 68). This was later called the "IT market testing branch"

(Australian, 12 February 2005: 1 - All-round Country, 35). The outsourcing was surrounded by good management talk. Later still Jo Hein, Customs national manager of IT market testing was to confirm this, and alleged that "outsourcing most of its IT functions to one vendor (EDS) was successful, but resulted in lack of innovation and internal expertise. Through lessons learnt, Customs decided to move away from a single-vendor outsourcing approach. 'One provider can't do it all'" (ZDNet, 09 June 2005 02:43 PM).

John Begley, Chairman of Tradegate Australia Ltd, announced that Tradegate would now concentrate on MaxeTrade, a new company formed by Tradegate, Max eCommerce, the Customs Brokers & Forwarders Council of Australia (CBFCA), and the Australian Federation of International Forwarders (AFIF), "as a result of industry demands for an enhanced communications and e-commerce platform to meet the requirements of the industry" in the new customs environment (Tradegate press release). Thus Tradegate was sensibly seeking a new market niche, which might well have effects later, if it was possible to identify the efficiency of third party software providers protected by commercial in-confidence.

At the end of November the new Customs systems were reported to have cost $165 million, but "fears that the new systems would be unreliable, as well as expensive, have abated since the exports release of ICS went live late September" (AFR, 30 November 2004: First 29). A few days later a parliamentary press release described the "total development and implementation costs to the point of the imports cutover [as] close to $188m" of which $55m were for the CCF. The imports module was expected to go online after April 1 2005 (9XXF60). Later still Murray Harrison was reported as expecting the system to cost about $20m per year to maintain (Australian, 12 February 2005: 1 - All-round Country, 35).

In March 2005 the Customs Brokers & Forwarders Council of Australia expressed serious concerns about the usability of the import system, saying the specifications were "flawed from the viewpoint of the end user", and that security issues remained (Lloyd's List Daily Commercial News [ABIX Abstracts], 17 March 2005: 4). In April the CBFCA began pushing for an extension to the deadline of 20th of July and a meeting was held with Customs Minister Chris Ellison and Customs. The CBFCA

complained about new design features and stated that "many industry software developers… claim[ed] that they cannot adequately complete and test software prior to the legislative implementation deadline" (AFR, 11 April 2005: First 15). Each business apparently needed to establish business specific interfaces and thus needed to have a fully working customs system in order to write these interfaces. This would tend to mean deadlines for businesses and for Customs would always conflict, and a Customs spokesman said Customs had "already provided generic overviews of the new imports regime to more than 1000 attendees" to ensure the ICS system was understood, and had "delivered extensive training and information sessions in all states to ensure detailed information is provided to industry operatives" (Australian, 12 April 2005: 1 - All-round Country, 33). The result of the meeting was that Customs kept its preferred release date of July 1st, with the CBFCA requesting ICS training, a "business continuity plan in case components of the Imports module failed", and a transition period of 80 days (AFR, 14 April 2005: First 21). It was reported that some "transport heavyweights such as Qantas, [and] 1-Stop (a transaction-processing joint venture between P&O and Patricks)" had been expecting a delay and had not really done much work on their interfaces (ComputerWorld, 19 April 2005).

Shortly after this it was further reported that the export module was running with a 60% error rate (Lloyd's List Daily Commercial News [ABIX Abstracts], 28 April 2005: 6).

Another meeting was held with the Customs Minister and it was expected that the final deadline for the imports module would be switched from August to October. Darryl Sharp of the CBFCA said "The minister and customs have acted responsibly in listening to all of industry, researching the issues and announcing that a new date will be set at the completion of proper systems development and appropriate testing" (Lloyd's List, 9 May 2005: 6). A week later the CBFCA was wanting "a parliamentary inquiry to see if a review is needed to discover the process and reason for the escalation of [the system's] costs" (Lloyd's List Daily Commercial News [ABIX Abstracts], 19 May 2005: 7). This may have been because another $80m was given to Customs by the Government, *and* import processing costs were increased (Joe Ludwig Parliamentary Press Release, 314G60, 23/5/05). Minister Ellison did announce that "The imports component of ICS will be available for use by 19 July

2005 under existing legislation, but industry will not be required to report in ICS until just before cut-over time", and that if industry needed more time then legislation would be introduced into Parliament to extend the transition period (Parliamentary Press Release, Y05G60, 24/5/05).

Later that week it was revealed that there was still friction between different business groups, about the time of the release. October was considered by some to be in the busiest period of the year and by others to be well before the Christmas import rush of November (AFR, 27 May 2005: First 82). A meeting of the Customs minister with stakeholders in early July agreed that the transition phase should start on the 19th July and finish on the 12th October after which the Compile system was to be no longer available (Ellison Press Release, 5 July 2005 LBKG60; Lloyd's List Daily Commercial News [ABIX Abstracts], 14 July 2005: 9). Other reports suggest the meeting was further split between those who wanted a later cut off date and those who wanted to get on with it (Computerworld 6 July 2005). The CBFCA wanted the system to be guaranteed prior to going live (Australian, [ABIX abstracts], 2 August 2005: 31). It was alleged that the CBFCA opposed the new system as many members stood to lose business because the new system allowed importers and exporters to deal directly with Customs rather than using service providers (ComputerWorld, 27 September 2005).

It seems to have been agreed that people had to shift over from the old FormSecure method of logging into the System to the CSI interface by the 14th July (ICS updates, 11 Jul 2005 12:46 PM). Between 19 and 31 July 2005, it was reported that the cargo management system was down for 23 hours, mostly due to installation of the imports component. There were 180 known bugs to be fixed (Australian [ABIX abstracts], 2 August 2005: 31). Later on it was alleged that a report in August had suggested that the Customs Mainframe lacked the power necessary for the system: "The projected capacity requirements to September/October 2006 suggest that there is a major capacity problem imminent… Further mainframe performance savings ... must be found and implemented ASAP" (Technology Daily, 22 November 2005).

During September Customs were also to be testing a new CSRIO neutron and gamma ray scanning device, at Brisbane Airport to search for imported cargo for drugs and explosives (Lloyd's List Daily Commercial News [ABIX Abstracts] 23 June 2005: 3).

By late September many importers still had not applied for the Digital Certificates they needed to access the system (Computerworld, 27 September 2005).

By early October some were claiming that chaos would eventuate as the software necessary to access the system only arrived at various companies in the week before the final switchover. Slightly later "Paul Zalai, an industry representative [high in the CBFCA] who has worked with Customs for years on its new systems" said "One of the major problems associated with the introduction was that many third-party software developers (who supply products to Customs brokers and freight forwarders) did not have [a product] fully developed or deployed to users" (AFR, 25 October 2005: First 29).

Stephen Morris of the CBFCA was describing the situation as an absolute stuff up. He claimed a "recent survey by the [CBFCA] found 90 per cent of its more than 200 members were simply not ready for the change to the new system" (SMH, October 11, 2005; AFR, 22 May 2006: First, 6). As a result of these problems Customs agreed to allow custom brokers a further 12 days to prepare for the ICS, with brokers being able to use Compile until 24 October 2005 (Lloyd's List Daily Commercial News [ABIX Abstracts], 13 October 2005: 3). On October 11th a customs spokesperson said that "there's nothing to indicate the system won't be able to cope with anything thrown at it on October 12" (Australian.it.news, November 08, 2005). After October 12th had passed, some brokers asked for the Compile system to be extended until January, as there was not enough time to train people to use the new system, which was not working well and had large delays. David Katte, managing director of Cridland-Katte Customs Agencies, said: "We've had to stay with Compile. ICS is just a disastrous, bloody mess at the moment". Richard White, the chief executive of one of the industry's largest software developers Eagle Datamation International, described the changeover as "ugly" and said that the company was working overtime to get customers' systems running smoothly, adding that: "It was always going to be a tough time; we just didn't think it would be this tough" (AFR, 13 October 2005: First, 25). A

seminar on the new system organised by Customs was reported to be badly attended as people were too busy trying to sort out disruptions at their workplaces – an example of compounding. Darryl Sharp of Austin International stated they only got their software on October 7th with "no manuals, and the software's got bugs in it", and they were not able to move cargo (ZDNet, Australia 13 October 2005 04:58 PM). Several days later, Qantas was reporting that customs brokers had "difficulties processing bonded cargo through the new system, resulting in its Melbourne and Sydney terminals nearing capacity". The airline also noted "increasing periods of time between cargo arriving at the terminal and collection by freight forwarders". Emergency talks were held on the 18th of October (Australian, [ABIX Abstracts], 18 October 2005: 29), and it was reported that " vehicle imports [were] not being cleared and voyage booking numbers are often in error". "A leading forwarder", said it had cleared 33 jobs that week, down from an average of 437 jobs a week (Lloyd's List, 19 October 2005: 3). By the 20th the NSW Minister for Ports was claiming that the docks were so jammed with uncleared containers that Port Botany would soon be at a standstill. Brian Lovell, chief executive of the Australian Federation of International Freight Forwarders was complaining that the system had not been delayed until January and that "the situation would only worsen unless the port reverted to the old computer system" (SMH, October 20, 2005 - 4:20PM). "A Customs spokesperson said that much of the problem was the result of inaccurate data being put into the system" (Lloyd's List Daily Commercial News [ABIX Abstracts], 20 October 2005: 7). This was because for security reasons, the system had been designed to refuse to accept "variations as small as a single digit or character in item numbers" generated by differences in the systems of shipping lines and freight forwarders. The new system, unlike Compile did not tolerate these variations, or allow transaction numbers to be amended on-the-fly. Errors required re-entry and thus sent the user to the back of the processing queue. Here we can see a classic example of increased order making something which had previously been simple, more difficult. This may have been the main cause of the October problems. "Reverse adaptation" was being demanded from users.

Murray Harrison admitted that some users had been able to see the documentation of other users in "isolated cases" "We understand there was an issue, but the fix is in. There is no general issue that people can see each other's data," he said (ComputerWorld 20 October 2005). About the same time a customs spokesperson

said the changeover had experienced difficulties, that they had taken action to help move containers from the docks to depots, and they were seriously considering allowing sea cargo to revert to Compile (ZDnet 20 October 2005 03:18 PM). After a meeting (possibly a video conference with the Minister in Broome on Oct 20) Customs stated it would not revert to the old system. It was reported that this was because "Australia's two major retail giants Coles and Woolworths… have linked major supply chain overhauls worth billions to the ICS". The Minister confirmed that "major retailers had indicated they want to keep the current system running" rather than revert to Compile (ComputerWorld 21 October 2005). The business split, and the different intentions, could not be clearer. There was probably no solution which would have made everyone happy, and so an attempt to avoid catastrophe collapsed in power relations and internal conflict.

Despite this Minister Ellison said on radio that morning (the 21st?) that the ICS system would be switched off unless proposals to alleviate the situation were successful. "It was designed to make it faster not slower and that's why I've said that if by midday today it isn't working, we'll revert to the old system" (ZDNet, 21 October 2005 05:27 PM; australianit.news, October 21, 2005). "Contrary to some media reports, the new IT system for imports has not failed, nor is its performance solely responsible for the problems that have occurred. The problems experienced in part, flow from inaccurate and incomplete information being submitted by some users, which the new system is designed not to accept for security reasons," Australia Customs said in a statement Oct. 21 (American Shipper, 31 October 2005). The old system was not reverted to – afterall the fault for the problems could be placed elsewhere and it might not advantage some powerful players.

At this point the Australian Computer Society made a press release saying they "would like to believe appropriate project management techniques and governance were applied throughout the $250 million ICS project… it is critical that ICT professionals and their managers working on major software projects understand and apply appropriate procedures and standards to ensure these systems work properly once they are introduced". They offered their services to any inquiry (ACS Media Release, Friday 21 October 2005). This can be seen as a ritual re-proposal of "good management", as well as an attempt to increase their own power and control in the

situation, and help out. But the assumption of bad management as an explanation seems to have come first, along with the idea that procedures and standards would have a beneficial effect and were not being applied. It is not probable that they could actually know this, and it is also not probable that Customs had not attempted this.

Stephen Morris of the CBFCA claimed the new system was causing the industry to lose $2.6 million a day and that the mess could have been avoided if the old system had been kept on. Federal Trade Minister Mark Vaile "said brokers and agents who had failed to collect containers were mostly to blame" (SMH October 24, 2005; Journal of Commerce Online 24 October 2005). The Ports Minister of NSW, Eric Roozendaal, who was a member of a different political party, claimed that the backlog would cause a major NSW port to close in 24 hours, was hitting business with extra storage costs, and was damaging the NSW economy (AAP General News, 24 October 2005), while Stephen Bradford of the Melbourne Ports was predicting gridlock there by the end of the week. The CBFCA explained that cleared cargo was stuck behind uncleared cargo, and that trucks had to be slotted in through the Patrick and P&O vehicle booking systems (SMH October 24, 2005 - 8:33PM). Qantas Freight "called on freight forwarders to collect their inbound freight as quickly as possible to clear space for incoming cargo at terminals in Perth, Brisbane, Melbourne and Sydney". General Manager Robert Lugton said: "All four terminals are at critical capacity levels, and delays in the collection of freight over the weekend will have a major impact, particularly at the terminals in Melbourne and Sydney." Chris Jensen the national freight forwarding manager of TNT Freight Management, said the new system was causing "almost total disruption to the business of Customs clearing and delivering import cargo" (Australian.it.news, OCTOBER 24, 2005). This is a case of the compounding of systems, their 'coupling' or 'apraxia'. No system is alone, and so cannot be controlled alone, and thus is likely to be disruptive of other systems once it stops functioning perfectly.

A Customs press release stated that their help desk had been reorganised, and that on hold messages were being constantly updated. ICS reference material was copied to a new website, a list of cleared cargo was being updated on the Internet daily and "Customs has extended the use of COMPILE, a legacy system, to allow brokers and freight forwarders without adequate software to pay for and obtain their goods"

(Customs Media Release, Monday 24th October 2005). Customs chief Lionel Woodward, said the decision to persist with the system was supported by the industry, importers and stevedores. "As a result of the ICS, we're generations ahead of what we've had, which was a patched-up system of 40 to 60 applications that didn't talk properly to each other. The ICS covers both sea and air cargo, enormously increasing our law enforcement and security capabilities" (AFR, October 25: First 9). This might seem to be a somewhat partial representation of the system, but it also promotes good order in the future, thus justifying disorder in the present. Order is possibly always somewhere else. What it also forgets is that people had probably worked around old problems to the extent that these no longer seemed problems, but part of the way that the world worked. New problems would be a different issue.

On the 24th October Patrick Stevedores told customers that ships could be delayed from the 25th in Melbourne, and in Port Botany by the 26th, and it was being proposed that Customs should check all import declarations, which failed in ICS, for a security assessment and just release them (Lloyd's List, 25 October 2005: 12). People within the Customs Department were telling the AFR that they were recommending that the old system should be reintroduced for Ship's Cargo. "The new software has problems producing manifests for agents and importers," one insider said. "We don't know what's causing the problem yet so we don't know how to fix it". However, Customs denied this advice had been given, and suggested people should continue to use ICS. "Customs added that it had cleared 45 per cent of stalled cargo from Melbourne and Sydney ports". However, terminal operators said the problem had simply been shifted to warehouses as the new software did not advised importers when cargo had been cleared (AFR, 26 October 2005: First 3). Disorder can be moved elsewhere to try and establish order which is visible to the orderer.

Customs NSW regional director David Collins, agreed that Cargo was moving but that notification and messaging was a problem " there have been problems getting that clear[ed] status to the waterfront" (Asia Pulse, 26 October 2005). By the 26th it seems that six ships were waiting to enter Port Botany although P&O insisted it was still managing to unload ships (Australian, 26 October 2005: 1 - All-round Country, 2). P&O and Patrick were providing extended hours to help collection of imported freight (Dow Jones International News, 26 October 2005 16:43). Truck drivers were also

reported as being annoyed and as loosing money. Bob Stewart, a truck driver for the past 32 years told the SMH that he normally moved six containers a day, but was now transporting two or three 'if we are lucky'" (SMH, October 25, 2005 - 4:01PM).

The Minister engaged in Crisis Talks. A "joint industry and customs business and technical working group" was set up to try and identify a fast and easy process for fixing the problems. Brian Lovell, CEO of the Australian Federation of International Forwarders (AFIF), said he was happy with the progress that was made at the meeting, and identified the matching issue as being important. "There should be some fuzzy logic that says, 'I have got five items to match here, four of them do match and one doesn't -- this must be the same shipment.' But [ICS] is not clever enough" (ZDNet, 27 October 2005 05:42 PM). It was of course, specifically designed not to do this, as the standards of brokers were not the standards of security. The Minister expressed his confidence in the system. Customs said everyone wanted to go ahead, but success depended upon "Customs and third party software suppliers delivering system enhancements as efficiently and expeditiously as possible" (AAP Financial News Wire, 26 October 2005).

Opposition Leader Kim Beazley called for the new system to be abandoned until after Christmas (Australian.it.news, OCTOBER 26, 2005), and Opposition spokesperson Joe Ludwig claimed that "much of the clearance work is today going back to the pre-computer age of pen and paper – with Customs staff across the nation diverted from their regular tasks to assist in manual clearance". Ludwig's main aim during this period seemed to be to locate the blame entirely with the Minister. This was not completely wrong, except that in distributed governance, any node could be at fault, and is probably at fault, depending on who does the looking. It is doubtful the Minister could have controlled or coordinated events much better without recognising the importance of the social conflicts involved.

It *seems* that the next day trade Minister Mark Vaille reiterated his call for agents and brokers who had cargo cleared by customs to move it. To which Philip Lovel, chief executive of the Victorian Transport Association replied that "'Conflicting messages' about the release of containers by Customs had resulted in 'many futile trips to the wharf by many carriers, which could attract 'no-show' penalties from stevedores'"

(The Age, 28 October 2005: first, 1). Joe Ludwig claimed that the list given to importers and that given to stevedores were often different. "Labor members and senators are receiving reports that when small business owners actually do send a truck to the wharf, based on the listed information from the new website, the stevedores won't release the container because their lists and the brokers' lists quite often don't match up" (Asia Pulse, 28 October 2005). Again the attempts to gain more accurate and specific data for the system were not helpful in keeping it functioning. Kim Beazley added that ports crippled by the defective computer system could be targeted by terrorists (Adelaide Advertsier, 28 October 2005: 1 – State, 29). Which, although perhaps improbable, was possible and was probably not what the new security conscious data gathering process had aimed at. It had subverted itself.

Sean Nearey, president of the New Zealand Custom Brokers and Freight Forwarders Association claimed that goods were starting to move but that "freight records [were] frozen inside the computer". Don Braid managing Director of MainFreight said his company was working almost 24 hours a day to clear freight through Customs and added that "the situation wasn't helped by the initial reaction of the federal government, which he described as 'head in the sand stuff'" (Dominion Post, 1 (NZ) 28 October 2005). "Debacle is a kind word in describing the past two weeks," said Mr. Scott Rofe, Managing Director of Flag Seawing in Sydney, "The general brokerage and freight community consensus is that the system should be shut down and we revert back to the old system, which is only about four years old anyway". "Early on the customers were not understanding at all," he added, "but after a media blitz by the government and general news and media agencies their [the customers] perception of the issues and problems encountered have changed and have diverted their frustrations to the government and not the forwarder and or broker" (Aeroceanetwork Media Release clickpress 5188005cp). It is easier to locate blame than to suggest what could have been done, given the social factions and ordering difficulties involved, without being ritualistic and restating what is already agreed on.

Murray Harrison, the CIO of Customs claimed at Senate Estimates committee hearings that "We had what we would term trivial incidents outstanding, as you would with any software package you buy off the shelf… Those trivial incidents were numerous but the reality is in relation to the functionality that was critical to the performance of the

ICS. It was all available on October 12". However, trivial incidents can compound, interlink, and become non-trivial. Their individual triviality proves nothing – especially in a connected system. Harrison did accept that there were significant issues with brokers filing incorrect information (Australian.it.news, November 08, 2005), but this was probably appealing to him as it helped locate the problem elsewhere than in his immediate managerial domain (and with his mode of odering), and that is how he would have experienced it. Reports to the Estimates Committee revealed that the Customs Help Service received 13,000 calls about the new system in 19 days. The average time spent on hold for these calls was 22mins, although some calls took one and a half hours to get through (Joe Ludwig Website, media release 1/11/05). The AFR put the number of phone calls and emails at 23,960. It is hardly to be expected that the help desk could work under those conditions, and this again compounded the crisis as they were not separate from the problem as it developed – especially given people's sensitivity to delay.

Customs Chief Executive Lionel Woodward wanted to have the system working by a December legislative deadline which required the old system to be turned off. Postponing the ICS implementation until early in the next year was "irresponsible" as the legacy system would not receive Unisys support after March (which was in fact several months after December). This again shows the difficulties with distribution. Woodward also claimed that due to difficulties getting clearance more people had used the system which had further overloaded it. Again an example of compounding, and lack of isolation of failure. He blamed some of the initial ICS problems on independent software companies who were helping businesses to implement the system. "ICS [also] had problems matching up the various declarations made by shipping lines, forwarders and importers. These problems were aggravated by the fact that the CCF, which is the funnel by which all data is poured into the ICS, works at a slower pace than its predecessor". This shows that new system while doing more, seemed to be unable to work as well as people were used to, a not uncommon failing. People told the AFR that "concern is mounting that the new system does not have the capacity to handle the remaining load", that the department was "investigating the cost of keeping the legacy software running beyond March" and that "the modular nature of ICS made it harder to tweak once performance issues were uncovered". This latter point might be a claim in favour of a big implementation rather than a modular one.

Some objected that no one had been demoted or taken responsibility for the cost or failure – but noone could agree on quite who that should be. Transport and freight companies said there had been "no significant improvement" in reducing the backlog over the week (AFR, 2 November 2005: First 1, 52).

Later that week the Minister was claiming that "over 92 per cent of those dealing with imports and exports, as I understand it, are dealing with the new system" and that in meetings in late September "the vast majority of industry expressed a desire for the cut-over to proceed on 12 October and, if we had not done that, we would have been roundly criticised". Senator Parry added that "On 4 November there were 18 brokers using only the old COMPILE system, with a further 67 brokers using both the ICS and COMPILE systems. The total number of brokers using only the new ICS system is 267. We have successfully processed over 4.5 million export messages since 6 October 2004. Since 12 October this year, 1.7 million import messages were successfully processed" (parlinfoweb, Questions without notice 8/11/05).

Other customs computer projects "including a human resources and rostering package, an electronic document management system and a server and network storage project have been put on the backburner", while the ICS problems were approached (Australian.it.news November 08, 2005). The AFR reported that Customs was asking Unisys which maintained the old Compile software, how much it would cost to extend the current contract beyond its expiry date of December 31 (AFR, 10 November 2005: First, 9). On the same day the Treasurer and Customs Minister announced that Michael Carmody who had administered the Tax Office computer change over would become the new CEO of Customs on his own request (parliamentary press release 10/11/05 EWWH60; ZDNet, 10 November 2005 01:43 PM). CBFCA executive director Stephen Morris said that "Mr Carmody will have to re-engage businesses in more effective consultations about the role we can play in supporting policy outcomes – and the ICS problems are a classic example of where industry was not engaged" (AFR, 11 November 2005: First, 49). Yet we hear constantly from Customs and from the Minister that industry was engaged. Presumably this is a case were *part* of an industry is being perceived as a whole, with common interests rather than as a collection of factions with differing interests and differing representations in the social system around the technology.

A week or so later it was still being reported that the system still appeared "to be operating up to five-times slower than intended". The specially-created action group claimed that the various fixes and patches had "not yet eradicated the key issue of data mismatch", which may not have been possible given the different needs involved. On top of which shippers were "bemused by this week's introduction of increased import cargo clearance fees… The air cargo clearance fee has risen from $A6.50 to $A14 and the sea fee from $A6.50 to $A7" (New Zealand Transport & Logistics Business Week, 17 November 2005).

At this time various reports, in particular the CMR Mainframe Capacity Review, were leaked to News Ltd and the Opposition. These showed that the ICS was losing messages and running slowly in the lead-up to its October 12 launch, and that its computers were not powerful enough. The IBM Mainframe ran at 3000 MIPS, and it was estimated that the required demand would jump to 5500 MIPS on system launch (Australian, 22 November 2005: 1 - All-round Country, 29). The Australian added that its sources had said "Customs was forced to do an emergency upgrade just days after the launch of the new system when it became apparent the system did, indeed, not have the capacity to run the software" (theaustralian.news.com.au November 22, 2005). Customs responded that they "refuted" reports they "turned on the imports component of its new IT system before it was ready… Capacity requirements were under continual review and encompassed hardware as well as software considerations" (AAP, 22 November 2005). It was implied that the upgrade, a few days after the launch, was planned. Murray Harrison told the Australian that because people could not get through to "officers on the ground" they overloaded the web-based system. "The pressure on the web-based system was only a few days. It's the sort of thing you could only discover on experience". The Mainframe Capacity Review he described as a "70-page highly technical report which has a line about capacity" (Australian, 23 November 2005: 1 - All-round Country, 8). Senator Ellison, in response to a question from Joe Ludwig also stated it was "a highly technical document, some 70 pages in length" and as "a technical report, lengthy in duration". Furthermore it did not come to his office and the CEO of Customs had denied the implication that Customs was not prepared by saying that "no emergency upgrade was undertaken and that no messages were lost". Customs "acted on recommendations of that report". Anyway the

Mainframe had been upgraded four times since March of that year (Questions without notice, 29/11/05 2.52 p.m). Reports on messages getting lost varied with the source. It is probably hard to tell if messages were lost because there would be no record of the loss, otherwise they might not be lost.

A week later Customs would be reported as acknowledging that the new system was slower than the Compile system, and that over 100 people would remain on the Customs development team to finetune the ICS until mid-2006. Murray Harrison claimed that: "The system doesn't process as fast because it is doing a lot more. Most of the grunt is directed towards cargo risk assessment environment, towards making a decision on whether particular cargo poses a security risk". This requires much more data than the old system had to handle, and the data has to be much more accurate.

> The system is unforgiving when it comes to data quality. If you don't put the right info in, your cargo won't get cleared. We thought we had done plenty of training and consultation, we expected people to put in the right stuff… That's what the system was built around. It was not built around reacting when they didn't. That's what we are now talking about. Perhaps we were too idealistic.

As stated before, this seems to be a classic case of control leading to confusion, and increased complexity, or intensification, slowing things down. The CBFCA's vice chairman Darryl Sharp added that it now took longer to deal with Customs and "Industry will have to recover those increased costs, just as Customs is looking to recover the costs of its increased border security activity. Eventually it will be importers and consumers who will pay all these costs" (AFR, 29 November 2005: First, 29). A little later Bluefreight director Richard Dexter was claiming that "processing imports for customs clearance took four hours when under the previous legacy systems it took 10 minutes" (aeroceanetwork.com December 2, 2005). The ABC reported that brokers and agents were having severe cash flow problems as a result (World Today, Tuesday, 6 December 2005: 12:21:00).

By mid December the log jam at the ports was reported as being cleared. "The NSW government said more than 140,000 tonnes of consumer goods had been moved through Sydney's Port Botany in the lead-up to Christmas". However Ports Minister Roozendaal said the federal government had demonstrated "ongoing incompetence" over its implementation of the new Customs computer system (SMH December 19,

2005 - 11:00AM). In general it could be claimed that "the system has been running relatively smoothly since business has become more expert at using it" (AFR, 25 January 2006, First, 7). In other words users had to adapt to the System.

Despite the claims of the software being better at tracking imports and gathering data, a Report from the National Audit Office argued that Customs was not large enough to monitor all the cargo that enters the country to check whether it contains the goods declared and whether appropriate duties have been paid. "Accurate and reliable compliance data is not readily available or being used to evaluate the effectiveness of… compliance activities or as a basis for management decision-making" (AFR, 1 December 2005, First, 7). In other words it is possible that Customs was not, in fact, able to make use of the data provided by the computer software that was supposed to enable it to act.

Complexity exceeded capacity.

Section 6: Aftermath of Installation

In the new year:

> Peter McNamara, managing director of air freight wholesaler AMI and chairman of the Australian Federation of International Forwarders [said] customs had been deaf to all suggestions and warnings from the industry when the system was devised and introduced, making it what the logistics industry says is a model for how not to roll out new systems and what is certainly an example of the gap between government action and commercial execution. "The whole thing was put together by bureaucrats more interested in building a monument to their egos than developing a working system," he said. "It's about five times more complicated than what we had before, and it doesn't do any more" (Air Cargo World, 6 January 2006)

Bob Wallace, chairman of the CBFCA and managing director of customs broker Wallace International, stated that the ICS system had hardly improved since roll out. Before the introduction of the ICS, his company could complete 30 to 40 freight clearances a day. Now, the clearance was about half that, with his employees working longer hours. Brian Lovell, chief executive of the Australian Federation of International Forwarders stated that the "the work-arounds that were put into place to get around some of the system blockages are still operating". In this case the fudges become part of the system, and some brokers did not want any more change. They "feel that they've got an easy, workable manual system and want to keep using it … They're frightened the system will do what it did between October and December, but in many cases those problems have been resolved'' (Australian, February 21, 2006: 30). In March Wallace said:

> We've identified the problems, but nothing has been fixed. We haven't got any major improvements to this point… Our industry simply can't maintain what's going on at the moment… We're working extra hours, using all kinds of workarounds-which mean non-ICS procedures-using rubber stamps and paper, moving away from initial computer operations (Australian, March 20, 2006: 9).

By June 2006 Customs had received 380 compensation claims worth $9 million (AFR, 13 June 2006: First, 5).

A problem with power in late January did not help, throwing the whole system off air (backup systems were also incapacitated), and forcing the use of a new contingency

plan in which "manual processes are invoked and Customs officers are authorised to okay the movement of goods without the payment of the relevant duty or GST" (AFR, 25 January 2006, First, 7; Australian, January 31, 2006: 3). It later transpired that EDS had arranged the power cabling so that all the computers were on the same cable and had thus fallen victim to a failed cooling fan (AFR, 2 February 2006: First, 18). In which case, the failure could have happened at any time. Customs ruled out penalising EDS for the failure (AFR, 20 February 2006: First, 16).

Murray Harrison in an interview with Information Age claimed the reality was the system did not crash on the first day. "The reality is that, in spite of difficulties experienced by users, the system successfully processed more than 50,000 messages on its first day" and the systems integrity in the first two weeks was never in doubt. The only real problem he recognised was when one user reported seeing a competitor's data. Harrison said: "This was a serious problem. During full-load tests, nothing like it had shown up previously". It transpired that a user's query to the connection manager was designed to stay open for 30 seconds, and this allowed a leak between that and another concurrent session. Reducing the query parameters to zero seconds initially appeared to stop the problem. However "a week later it happened twice more, which had us stumped. The vendor's engineers arrived really quickly from the US and we worked through the night to create a trap for the flaw so we could log the sequence". Harrison also said that reports that "unanswered messages sent to ICS were lost, that containers of perishable goods were left in the sun, that the Customs mainframe had insufficient capacity, and that the Government was having to bail out Customs with an extra $100 million", were untrue. He continued: "It's about perception. From our end, consider that of the more than 16,000 business rules that ICS manages, there were probably problems with fewer than 200 them so the fail rate from this perspective was small" (Information Age, 14/02/2006 11:26:31).

In February it was announced that Booz Allen Hamilton had been appointed to independently assess the CMR (AFR, 16 February 2006: First, 12). The new Customs Chief told a Senate Estimates Committee that he was "not satisfied that the ICS is operating as smoothly and as well as it should be even now" (AFR, 18 February 2006: First, 9).

As we might expect, management remedies were thrown around as solutions. Raymond Young from Macquarie University, describing his own work wrote that:

> * The main culprit of IT failures is almost always the project sponsor, the manager responsible for a project within the organisation.
>
> * Boards run a close second for failing to make the project sponsor accountable.
>
> * Project management and technical considerations are over-emphasised. They alone will not deliver promised benefits….
>
> In this age of accountability two questions should be asked:
>
> * When will boards, senior managers and ministers take responsibility for IT project investments?
>
> * When will they stop deferring to so-called experts, apply commonsense and demand non-fictional answers to difficult questions? (AFR, 9 November 2005: First, 63

Mark Toomey of Infonomics claimed the Project had not been properly "scoped". "A fundamental governance theme for major initiatives is to ensure that all facets of change are planned and delivered". "Key performance indicators should be established at the outset". "All change involves risk that something will go wrong. Wherever possible that risk should be mitigated by scheduling the change to avoid factors such as a high workload that could exacerbate a problem". Too many stakeholders were involved, with too little consultation, and quick fixes exacerbated problems rather than solved them. "It was clear that the change program was going to need intensive, ongoing, high-level focus to ensure that it went smoothly. The governance regime should have ensured that all stakeholders were properly represented and engaged in the process, and that all voices would be heard" (Philipson November 29, 2005).

Of course this all implies order is simple and predictable, even when the system being installed is changing what is being managed, and that responsibility is possible and easily allocatable. It also presumes that the results of the system and the amount of complexity involved can always be estimated in advance, and that the groups involved will agree on schedules, work loads and what is predicted, and that none will work against the good of the others. All of these points may not be correct. Such statements do maintain hope in the general system of ordering, and allows management to be

invoked, or performed, as a special form of knowledge which is needed to avert catastrophes.

Customs announced that it had received the Booz Allen Hamilton Report on the 9th June 2006 and "accepted all the recommendations contained in the review". A new management structure would be established to oversee future ICS development, and joint working groups would be set up "to explore potential improvements in trade facilitation" (Customs media release 9th June 2006). Bob Wallace claimed that the Report said nothing they didn't already know (Australian, June 13, 2006: 31). Customs Minister Ellison blamed importers for rushing the disastrous introduction of the Customs Service's Integrated Cargo System, saying the government was "overwhelmingly urged'' to push ahead with the project. The Australian suggested that this overwhelming urge came from big brokers rather than the smaller ones who make up most of the industry (Australian, June 20, 2006: 36).

The Booz Allen Hamilton Report (BAHR), conducted in five weeks, is interesting and important but at the same time, it was almost possible to predict in advance, what it would find and recommend. Ritual invocations of better Management and improved communication are not uncommon.

It tells us that difficulties with third party software meant that people attempted to use the online Customs Interactive facility overloading it and causing delays and frustrations. "These difficulties were not general, some operators had relatively minor issues, but the problems were widespread" (BAHR: 1, 9). Furthermore there was a mismatch between the high level of data quality required by the system relative to the legacy systems, and the level of data provided by industry. This resulted in "a large number of containers being held as high risk in the first few days after implementation" (ibid: 1, 9, 11). The Customs help desk was overwhelmed by calls (ibid: 9).

There was no budget for the project from inception. Testing was inadequate, and third party software providers did not have enough time to develop adequate interfaces. Implementation was not arranged in stages, being a "big bang" approach, and training of business was inadequate.

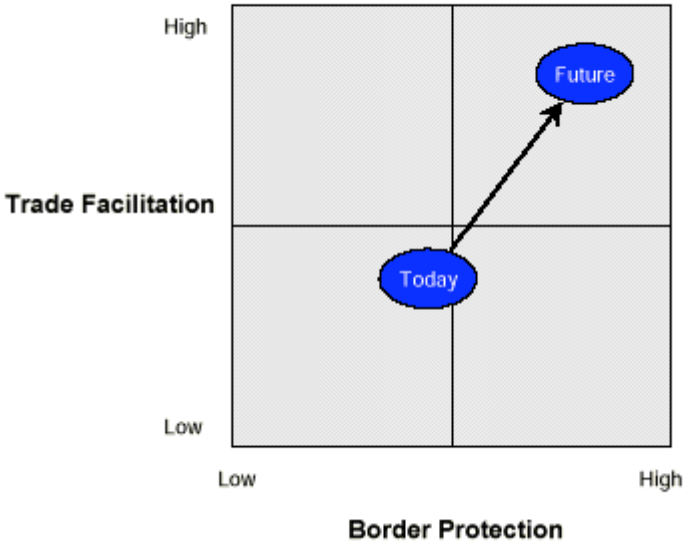
In general functionality and efficiency did not seem to be great. “We have seen no quantifiable improvement in Customs’ performance to date attributable to the introduction of the system” (BAHR: 1-2). “Measurements of the intervals between sea cargo reporting and cargo clearance currently indicate that performance is very similar to performance pre-October 2005” (ibid: 12, 15). “Use of the Customs Interactive facility takes considerably longer than the same process under the legacy system” (ibid: 14). “Some participants claimed that… Customs brokers now require 20% more time than pre-October 2005 to enter data and get clearances”. Strangely perhaps, despite the amount of new data collected “lack of detail (such as a customer reference number) to identify electronic financial transactions such as direct bank debits for duty and GST with a particular client or cargo continue to frustrate participants’ accounts departments” (ibid: 55). However, “Clients can now access Customs functionality via the Internet, replacing the need for expensive EDI gateways and dedicated data communications lines” (ibid: 18).

Recommendations included: having “a sound governance base” with “clear business ownership”; “Continuation for a limited period of the industry-driven tactical remediation program for the ICS” and: “a strategically focused program to exploit the ICS and improve the efficiency and effectiveness of Customs and the imports processes used across the industry”, with a “clear set of objectives, strong accountabilities and a high level of engagement with the industry” and “adoption of global best practices to achieve the performance improvement required” (BAHR: 2-3). It is difficult to find anything to disagree with in this. It is also difficult to see that Customs and others did not attempt to achieve this in the implementation. More practically the report claimed that customs had not given feedback as to which recommendations had been accepted or rejected and why. Customs had not been involved in “improving the quality or performance of external parties” (ibid: 29), which, however, might well have been condemned as interfering with business if it had been tried.

In more detail they proposed a conventional pyramid management scheme (BAHR: 35), with “clearly defined roles and responsibilities, accountabilities and decision rights” (ibid: 36). This was rounded out with much talk of “best practices”, and a

rather cute meaningless graph, which shows things improving if people adapt their recommendations (ibid: 38).

Figure 13 – Potential Improvements due to Adoption of Best Practices



There is no particular evidence that a pyramidical structure can be maintained in a system of distributed governance, and we have seen that those involved in this system included such powerful players as the Government, Coles-Meyer, DuPont, P&O, Patrick, Qantas, the CBFCA, the Australian Federation of International Forwarders, EDS, Unysis, Tradegate, various software houses, the parliamentary opposition, the State Governments, the Port Authorities, as well as the Customs department (and possible factions within that). That the programming and hardware was largely outsourced also contributed to distribution of power. Outsourcers have no particular loyalty to the orderers, but to their own profits. If governance cannot be confined, then it would be hard to allocate responsibility. Parts of the system would be out of the control of any single player at some time. Similarly as the system of communication between these people was to some extent outside of their control (as with 'the media') and partly being changed by the project, there is inevitably going to be clashes as the communicative relationships between the groups change. It was interesting that people in the CBFA obviously felt marginalised to the process, and yet are amongst the most quoted sources, and thus heavily influenced public perception of the events.

Reverse adaptation was heavily demanded by the new data system, which was built to conform to new security standards, and this was also going to change the relationships

between the groups involved, and set some of them in opposition to those who proposed, or implemented, these changes. The changes would also seem unnecessary to some, and, as new, could not be factored into user's expectations of the system. It is also debateable that any such a collection of groups could have agreed, in advance on data profiles, because they had different interests and the data served different functions, requiring different levels of accuracy, and getting the same data would require different amounts of work. It does seem obvious and was largely recognised, in this case, that the demand for more control and more data was in itself disruptive of previous systems. It also seems the case that reverse adaptation was what allowed the system to eventually function.

As a result of these and other factors involved in ordering users and data, previously simple actions were made complicated and much slower, thus disrupting the time patterns involved in the workplace, and probably necessitating new forms of control and more complication in the carry out of work. The systems were not separate, and could not be separated.

What I have called the ritual invocation of Management was a common response, and carried out by all those involved. This makes what is actually a common experience, the failure of ICT projects, an anomaly and restores faith in the ideology of management and the stability of our society and its order.

After all we can all tell that management is bad if a project appears to fail, and there is always a management alternative. Thus if customs had not contracted out programming, we can guarantee it would be blamed for not doing. If it did contract out then it could be accused of not managing the outsourcing and losing local knowledge. Customs can be blamed for not having a manager responsible – but it seems clear that there were managers with responsibility, but that when the project failed they blamed others, and possibly, in some ways, correctly due to the inbuilt distribution of power. It is not necessarily the case, in this kind of system, that because a manager is given responsibility they actually have control. Lack of a budget can be condemned, but then it seems common that projects often exceed budgets which are clear, and it would have been obvious to any manager that the budget was exceeded in this case, quite early on. Would it have been better to abandon the project when the

original budget of $30m was exceeded? Perhaps not as the original software had problems to begin with and could not cope with demands for more data. Demands for more data came from the potential to use ICT to get more data, plus newly activated concerns around 'security'. This is a case in which concern for security created insecurity. Clear project objectives might seem good, but over reliance on clear objectives could be criticised if potentials were not followed up and, again, it is clear that troubled implementation was not an objective, so to argue that "trouble free implementation" or "best practice" should be an objective is fairly useless, except in the ritual sense. Besides, if the system is inherently disruptive of previous social organisations, which it is and to some extent has to be, then it *cannot* be trouble free.

The fairly content free nature of blame can also be placed on the size of the implementation or its "big-bang" approach, even though it clearly had several modules, import, export and communication, and they were implemented at widely different times. If it had had clear modules then lack of coordination between them could have been blamed as was, in fact, the case with the third party software interfaces. It is also the case that Customs kept on the backup systems and the old systems so the allegation that the big bang implementation (if it was such) stopped any fall back is incorrect.

Even though the legislative deadlines were probably not helpful, they proved to be flexible, and if the deadlines had not existed then there would be complaints the implementation had no, or inadequate, deadlines and timelines. Deadlines were also not easily agreed to by the groups involved. If Customs had interfered with (i.e. imposed quality controls on) third party programmers this again would be a cause for complaint – the big unresponsive government bureaucracy interfering with business efficiency – what some called "bureaucratic egos". This interference might also be criticised for not respecting the "user centred design" which was recommended as a solution in almost the same breath. Furthermore hard deadlines probably would have encouraged even further the use of "deathmarches" and hence more disruption and untested programs coming into play and compounding with each other.

Although it was criticised for not doing, Customs did meet with stakeholders and interested parties, the problem was that there was no uniform stakeholder and

interested party position, and there could not be as these parties had differing interests and competed against each other. Communication does not guarantee co-operation, despite our mythologies. Organisational systems cannot override the social processes and politics which already exist without some pain and conflict. As the BAHR report states:

> There was strong support from participants for local Customs staff as they are seen as hard working and knowledgeable about the industry. However, Customs management in Canberra is seen as 'them' and 'they' who lack any practical knowledge of the industry, have a regulatory attitude rather than a genuine consultative approach (p 55).

Similarly the requirements for accuracy were not evenly distributed. Air carriers and shipping lines could delay giving information to brokers and agents, yet it was illegal for brokers and agents to submit late entries to Customs (ibid: 56). The social system, and its interconnections, was not investigated by those involved, during or after the events.

During the course of this incomplete history, it has been shown that there was a distribution in the perception of disruption. Often events and processes which were disruptive for small operators were not disruptive for large operators. Different degrees of disruption were experienced by people using different third party software venders, and there is no evidence to allow us to say this was a result of incompetence alone. The disruptions experienced by the transport industry were different again, as where the disruptions experienced by Customs itself. Partly the situation was driven by these differences in disruptions, and there is probably no guaranteed point of agreement for everyone, which we can call 'truth', or from which people could have worked together in managerial harmony, hierarchical or otherwise. Partly the events were driven by the fact that parts of the system could not be isolated from each other (even though they tried to behave independently), and these interactions had compounding apraxic effects. It is also possible to expand Winner's notion of the sense of autonomous technology as arising from the passive disposition of some, to this sense arising from the ways that people actively struggle with, and against, the system (both social and technical) within which it is deployed. It also seems that the attempts by people to impose order actually disrupted others, and that the chaos and order do come together. Disruption is not simply an accident or a something which can be discarded, but something which is inherent to the ordering itself.

Section 7: Final Summary

Given the variety of groups involved and the conflicts between them, it is fairly amazing that anything was done successfully at all. The groups included: brokers (big and small), software companies, computer companies, customs management, customs workers, politicians (state, federal, of differing parties), programmers, shipping companies and retail businesses. As well as conflicting with each other, none of these groups were undivided or without internal tensions. To simplify we shall just look at some of these conflicts and how they played out.

Looking at business conflicts with customs. Customs outsourced work to EDS c.1997. This split off knowledge and control from Customs. Staff left, either going to EDS or elsewhere. Customs lost ability to regulate at any fine, or day to day, level. Customs also lost knowledge. If customs sacked EDS, then they would loose all of EDS's knowledge, and systems would be in place which would have to be changed with this lack of knowledge. We might say that an ideology of corporate efficiency blinded customs to the problems in such a procedure. Eventually EDS was removed from software writing due to failed deadlines, and the work was distributed amongst multiple vendors which probably increased discrepancies in knowledge and procedures and increased problems of micro management, coordination and allocation of responsibility. Competition is not always an unmitigated good. EDS was kept on to maintain mainframes, which no doubt increased the possibilities of social conflict and did not further their attempts to help other people's software work. The functioning of Customs systems also depended heavily upon Tradegate who ran the initial system and who were to be superseded and abandoned. As the managers of Tradegate remarked it is not really obviously why they should pour their souls into this. Conflicts between Tradegate and others, also seem to have meant that it seemed impossible for Customs to continue with the old system after the new system failed. Influential social factors went against the most obvious solution, as well as the appearance of loss of face – which was important in establishing authority.

Likewise we can see divisions between the groups appear in the disputes as to whom Customs was listening to. Customs clearly thought it was listening to participants but not all participants thought likewise. Perceptions of engagement and response were

socially distributed. Conflicts between businesses also manifest in small importers apparently gaining freedom from large importers and thus the large importers refusal to help further this. There were conflicts over when was a good time to implement the new system which was probably centred around differing delivery times for Christmas goods depending on the nature of the business. Coles and Woolworths were not prepared to have the advantage their investments in integrated business systems gave them over smaller businesses overridden. Third party developers were unable to coordinate themselves with their customers or with customs, although the details of this seem hard to obtain. There was conflict over the allocation of costs, and the allocation of responsibility and blame. In a way we can see people attempt to solve the problems of the disorder produced by their ordering by shifting the disorder elsewhere: moving held up cargo around, shifting to new software writers, blaming incompetent workers, incompetent third party software writers, incompetent government management and so on.

Other problems arose from the nature of ICT. Thus we can see problems of complexity both intensification and compounding.

Intensification arose from demands for greater security and greater control, and classically lead to more chaos. More data was required and there was less room for error in the data, greater demands where put upon workers who had to adapt to the system rather than the other way around. Old fudges no longer worked, but eventually new fudges let the system work again – although probably not in the way intended.

Compounding arose when freight got stuck behind other freight. The previous related systems worked up to a point, and the new system blocked the old system. Supposedly trivial incidents mounted until breakdown occurred. The help desk was overwhelmed, so people used the internet to make complaints further overwhelming the computers. Time delays built up, faster than they could clear – people probably kept making complaints when their initial complaints appeared to be being ignored.

Time issues figure heavily in the implementation. Deadlines were in place and companies involved approved them. Companies seemed to have an unrealistic expectation of the adaptability of private enterprise over government – perhaps

because they both deal with organising others. Despite being fixed in legislation deadlines were extended on request and punishment clauses where revoked. This points that punishment clauses are generally useless; if the people cannot get the program written on time, then punishing them will not help get the program implemented properly. Deadlines if implemented seriously help cause deathmarchs, lack of testing and ignoring the unexpected linkages between systems. Perceptions feature in the disruption, expectations of delay produced delay.

It is too easy to blame bad management for these problems and to then ignore all the recurrent social and technical factors involved in producing the observed disruption.

Glossary

AFR = Australian Financial Review.

AFIF = Australian Federation of International Forwarders

CBFCA = Customs Brokers and FreightForwarders Council of Australia

CCF = Customs Connect Facility

CI = Customs Interactive.

CMR = Customs Management Re-Engineering (the overall project name).

EDI = Electronic Data Interchange

EDS = an American software and hardware company.

ICS = Integrated Cargo system

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Abbreviations:

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