

Negotiated Order and Network Form Organizations

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Abstract: Throughout the 20th century, the industrial age roots of hierarchical top-down planning and command-and-control supervision have been the foundations for management thinking. At the beginning of the 21st century, many futurists and systems thinkers have widely declared that businesses must equip themselves to be more responsive to rapidly changing environments. Dynamic, knowledge-based businesses require that rigid forms of business governance give way to networked forms.

Since many successful businesses have shifted from autonomous independent enterprises to building alliances and inter-organizational relationships, we advocate a renewed examination of negotiated order and a focus on the fluidity enabled by it. The traditional advantages of legal order are being outweighed by its inherent rigidity. Under conditions of rapid change, maintaining an internally consistent set of rules, essential to legal order, is inefficient and relatively ineffective.

Systems of negotiated order are characterized by situational coordination of interests, flexible definitions of desired end states, and spontaneous initiatives by interested stakeholders. We examine the development of the Linux community and its negotiated system of self-governance, and offer three additional business examples that suggest how negotiated order may provide a platform for stakeholders to innovatively leverage the dynamics of the contemporary environment.

Keywords: Negotiated Order, Legal Order, Network Form, Systems Limits, Linux Community.

Introduction

Will 21st century businesses be managed and governed significantly differently from those in the 20th century? The conventional approach to business, as practiced by most western business executives and taught in graduate schools of management, represents a small variation on the mass production approach developed in the age of Henry Ford (Chandler, 1977). In the 1970s and 1980s, the concept of business evolved to include the "social architecture" of multinational corporations (MNCs) (Perlmutter & Heenan, 1979) and heterarchical (or non-hierarchical) form (Hedlund, 1986). In the early 1990s, research into the "network perspective" on studying organizations (Nohria, 1992) became more widely understood with characterization of "network organization" (Baker, 1992). Powell (1990) described network forms as:

... non-market, non-hierarchical modes of exchange [that] represent a particular form of collective action, one in which:

- cooperation can be sustained over the long run as an effective arrangement;
- networks create incentives for learning and the dissemination of information, thus allowing ideas to be translated into action quickly;
- the open-ended quality of networks is more useful when resources are variable and the environment uncertain;
- networks offer a highly feasible means of utilizing and enhancing such intangible assets as tacit knowledge and technological innovation. (323)

Since the late 1990s, the rise of increasingly loosely coupled business arrangements has gained prominence. The boom of regional technology clusters (e.g. Silicon Valley), cooperative incubators funded by venture capitalists, and offshore outsourcing (e.g. call centers in Bangalore, India) is often cited as a challenge to the corporate form of the 20th century. Businesses are not just exploiting the cost advantages of broadband Internet communications. They are extending their reach by reorienting and restructuring their form. We amplify Powell's identification of a unique arrangement in contrast to markets and hierarchical forms, and refer to these social systems – particularly in business, but possibly also in not-for-profit and public institutions – as *network form organizations*.

Others researchers have similar and compatible ideas under variants of this name. In contrast to a concept of a business enterprise as driven by executives at the top of a corporate ladder, Castells (1996) describes a "network enterprise" as:

... *that specific form of enterprise whose system of means is constituted by the intersection of segments of autonomous systems of goals*. Thus, the components of the network are both autonomous and dependent *vis-à-vis* the network, and may be a part of other networks, and therefore of other systems of means aimed at other goals. The performance of a given network will then depend on two fundamental attributes of the network: its *connectedness*, that is its structural ability to facilitate noise-free communication between its components; its *consistency*, that is the extent to which there is sharing of interests between the network's goals and the goals of its components. (171)

The shifts to network form organization require that the introversion characterized by the M-form (multidivisional form) organization give way to the openness of the E-form (ecosystem form) organization (Moore, 1998). Hedlund (1994) suggests that a view of the firm beyond the M-form "logic of hierarchical organization" be called the "N-form", where "'N' stands for 'new,' and 'novelty,' and comes after M" (82). From a systemic perspective, Hedlund argues that M-form

coincides with arithmetic thinking as addition and subtraction, as compared to the N-form that better links to multiplication. He describes six major themes for the N-form corporation:

1. Putting things together, *combining* rather than *dividing* them.
2. *Temporary constellations* of people and units rather than *permanent structures*.
3. The importance of *personnel* at 'lower' levels in interfunctional, interdivisional, and international dialogue, rather than handling coordination through '*managers*' and only at the top.
4. *Lateral* communication and dialogue rather than *vertical*.
5. Top management as *catalyst, architect* of communications (technical and human) infrastructure and protector of knowledge investment rather than *monitor* and *resource allocator*.
6. *Focusing* the corporation on fields with rich potential for combining knowledge elements rather than *diversifying* to create semi-independent parts.
7. *Heterarchy* as the basic structure rather than *hierarchy*. (82-83)

Our thinking coincides with these themes. In respect to Hedlund, though, we resist co-opting his "N-form" designation to mean "network form" organization. We trust, however, that we would have his concurrence that network form organizations require governing and managing in a mindset different from the traditional view of a 20th century corporation. Such shifts may be seen as more than a "third industrial revolution", and as an "economic revolution" (Cortada, 1999).

The network form organization is most interesting as a response by businesses that must operate in turbulent environments. In 1965, Emery and Trist established their causal texture framework that suggested that businesses should approach strategies and organization in ways appropriate to their environments. In placid and placid-clustered environments, simple goals and rules are sufficient. In disturbed-reactive environments, competition requires strategy and tactics to deal with competitors. In turbulent environments, building alliances with dissimilar organizations would lead to success for all parties.

The emergence of network form businesses at the dawn of the 21st century leads us to consider how organizations and inter-organizational relations require different practices and methods of coordination, in comparison to their industrial age predecessors. In this pursuit, our thinking is structured into the following five sections:

1. What is happening to businesses, as systems, reflected in the restructuring from integrated enterprises to network form organizations?
2. How does business predominantly oriented towards negotiated order contrast from that predominantly oriented towards legal (rule-based) order?
3. In what ways does negotiated order business operate differently in network form organizations? The history and development of the Linux community in the software industry is examined.
4. In what ways do features of negotiated order appear in more traditional business settings? Three additional examples from a variety of industries are described.
5. When should a business proactively choose a negotiated order approach? When is it advisable, and what are the risks?

In contrast to system design approaches that are specifically oriented towards intervention (e.g. Ackoff, 1981; Flood; 1995; Haeckel, 1999), our approach is inductive (Flynn, Sakakibara, Schroeder, Bates & Flynn, 1999). We are not prescribing a universal "best way" to deal with structural changes in the business environment. Instead, we have observed the nature of four

businesses – the oldest less than fifty years old, and the newest in operation for less than ten years – and suggest that alternative approaches to business governance are feasible. These alternatives may be worth consideration by industrial age businesses that believe that they have reached their limits in the 21st century.

The path on which the reader is led is intended to weave concepts with stories of businesses that illustrate key points. Negotiated order is not a new idea, but it has been under-appreciated over the past few decades. The business systems discussed are not necessarily intended as exemplars, but instead concrete examples where different examples to governance may be discussed.

1. Businesses reach their systems limits in complexity

Modern corporations are complex systems. Symptoms that indicate that a business is a system reaching its limits may include:

- Unsustainable economic structure: the enterprise or industry is unable to generate revenue sufficient to cover operating costs and required reinvestment. (This presents an opportunity for creative destruction).
- Questionable ethics or signs of amorality: the enterprise or industry demonstrates practices that are unsavory or undesirable, or generating consequences without raising internal interest.
- Inability to adapt to environmental changes: the enterprise or industry falls behind the needs of customers or other constituents.
- Turnover: the enterprise or industry is unable to retain employees.

In these situations, a business may be described as being "at the edge of chaos", in either a favorable or an unfavorable way. Industrial principles of order, organization and management that had been effective in the past seem inadequate to deal with the symptoms.

1a. Complexities in industrial age businesses are driving restructuring

More than sixty years ago, Andras Angyal asked: what happens to a system when it reaches its limits? His key concern was with ways to maintain integration in the face of disintegration tendencies and complex system environments. His answer was based on the 18th Century advice of William Blake: to learn to see all the world in a grain of sand. In contrast to analytic approaches, Angyal's philosophy was based on wholeness as a *unitas multiplex* – a system of interdependencies (Trist, 1992).

The integration challenges in social organizations of Angyal's day – in the 1940s – seem relatively simple in comparison to the complex interactions of today. In the first half of the 20th century, most industrial businesses were created, operated and identified by their founders, or a tightly-woven association of principals. They focused on well-defined lines of business, with stable customer sets and well-known competitors. Today's organizations operate in multicultural and multinational settings, where diverse pulls from disparate constituents make large scale conflicts in value systems an everyday challenge. These conditions set the stage for the disintegration tendencies we find prevalent in today's businesses:

- To maintain a corporate form, business executives must comply with an unprecedented level of "transparency" in their actions, with requirements in the U.S. such as the Sarbanes-Oxley Act.
- To meet the competing and conflicting demands of customers, today's workers report into "matrix organizations". Therein, they confront the dilemmas of satisfying two or more directions via two or more "bosses", with the 40-hour workweek having become a myth.

- Overseas competition from emerging low-wage countries such as India and China have driven employers to cut wages and benefits for current workers, to the point that these employees become unable to afford to buy the products they make or service.
- Rapid technological advances deter investment into infrastructure and skills that would enable the business to escape a death spiral.

These symptoms represent businesses and industries that are failing as systemic wholes. The dark side of complexity means that the best that a business executive can do may be draw attention to immediate miracles, while avoiding responsibility for longer term impacts and issues. At the close of the 20th century, downsizing and outsourcing became common business approaches to rationalization, breaking down integrated monoliths (Miles & Snow, 1986; Hagel & Singer, 1999).

Simultaneously, initiatives to improve supply chains or value constellations demonstrate recognition that industrial processes cross corporate boundaries (Hagel, 2002). With businesses operating in a network form, the promise of order in inter-organizational relations is heralded over prior inefficiencies in bureaucracy. In a network form, the organizational alliances and alignments set the content as well as the structural context. Form and content are both are critical to improving responses to rapidly changing conditions. The network is seen as a platform for coordination and governance in which relationships transcend the bounds of organizational lines.

1b. Responses to reaching system limits can be passive or active

Under conditions of environmental stability, hierarchical structures can lead to an organization rapidly reaching its limits. Even when environmental conditions are not fully understood, management often has a bias for action: any change in direction is better than no direction. If an organizational hierarchy is too tall, say more than five to seven layers, desired changes in directions from the top can become distorted as word passes down through the organization. In addition, insight from workers away from the center of power often doesn't flow efficiently to leaders. If and when the intelligence arrives from the edges, it can be only incorporated as incremental adjustments to the rules governing an organization's relations. The usual response -- flattening the hierarchy -- focuses on symptoms, often only resulting in the more systemic dissipation of the organization's focus. Not only are such efforts a waste, but internal turbulence increases as individuals modify their organizational, subgroup and personal priorities.

Three non-responses to a business system reaching its limits are described by Emery (1997a, 1997b). He outlines three passive maladaptation strategies that are essentially defense mechanisms:

- Superficiality: "Three attitudes associated with lack of depth are highlighted by Marcuse ... [and] may be paraphrased as follows:
 - instead of the critical "is this necessary?" the bland acceptance that "this is the way things are";
 - not "what should be" but what "grateful for small mercies";
 - not leisure as free uncommitted time, but as relief from bad feelings. (1997b, p. 101)
- Segmentation: "The second way of simplifying over-complex turbulent environments is to segment society into meaningful parts that are of a size that one might be able to cope with. (1997b, p. 107)
- Dissociation: "The third form of passive adaptation is the retreat into private worlds and a withdrawal from the social bonds that might entail being drawn into the affairs of others". (1997b, p. 109)

Emery (1997a) notes that these three strategies can be mutually facilitating, and are not mutually exclusive.

The second strategy, segmentation, decouples parts of an integrated business. As an incremental restructuring in organizational form, alignments of parts of the business to customer, product or geographic alignments can simplify and refocus efforts. A more radical restructuring into a network form reduces ties so that internal relationships (within the same corporate enterprise) and external relationships (with external alliance partners) receive roughly the same preference. Networks are seen as organizational forms that can rapidly adapt to changing demands and environment challenges by connecting and disconnecting -- "plugging and playing" -- inter-organizational relationships. Parties can redefine their relationships with each other in a fluid, peer-to-peer manner (Hawk & Takala, 2000). Each part (or node) on the network can systemically adjust their self-referential systems continuously, as decentralized responses to local environmental conditions.

Emery cautions, however, that:

If segmentation proceeds without parallel efforts to reintegration it may be a more serious obstacle to active adaptation than the more visible forms of superficiality and dissociation. [1997b, p. 107]

If the business is segmented to the point at which there is only the network, and no "whole", that system fails to satisfy a reason-for-being. This issue coincides with Sir Geoffrey Vickers' advice that we need to learn to appreciate values connected to facts, as opposed to facts pretending to be disconnected from values (Vickers, 1980). Vickers argues that order is maintained in these circumstances, compensating for the shortcomings of such disconnections, through the introduction of force. This force is a feature of a system reaching its limits, where the parts assume the whole (Angyal, 1941). These ideas tie into the Ashby argument for the need for evolving systems of order, seen in the shifting forms of stability found in dynamic systems (Ashby, 1952:54-64). Under rapidly changing conditions, relations between the parts may require a different form of governance.

1c. Successful adaptation requires rethinking business governance

In mutual social engagements, human systems strive for control. Where control does not emerge as a matter of course, humans actively turn to management. When management is ineffectual, attention shifts to governance (Ing, Hawk, Simmonds & Kosits, 2003). In this paper, our contribution is a look beyond the management of integrated businesses, and into governance of businesses operating in a network form.

In an integrated business, order is established through hierarchy, and top-down direction. As organizations grow, their direction gradually becomes more formalized via processes of rule-making that lead to procedures that "teach" an evolved understanding of the "best way" to others. Rules provide consistency in a stable environment, supplemented by the hierarchy as an efficient means for leaders resolve ambiguities via "yes or no" answers, leading to more rules as policies. Through strong leadership, resources can be aligned via central priorities, and activities can be coordinated around one set of values. When conditions are neither stable nor clear, this approach can lead to significant difficulties

In a network form business, order is established by each part acting autonomously, in coordination of a context where other parts also act autonomously. In this dance for order, relationship governance must be centered on negotiation. Negotiation is the most powerful path in situations where humans can't control the dynamics in the system, and fail to be effective in managing.

More generally, there is a growing need for diverse systems of negotiated order, as well as a need to reduce reliance on incremental mandates, pre-established rules and fixed procedures. We argue that a negotiated order as the only viable active adaptation strategy for a business system that has reached its limits. The systemic challenge we face is consistent as well with that articulated as large scale interventions (Flood & Jackson, 1991). Seeing the need to seek a fluid nature for a business is at least as difficult as finding ways to construct the fluidity.

2. Governance includes both legal (rule-based) and negotiated order

Ordered, or at least ordering, systems are critical to humankind, whom they are and what they do. Humans need to find an order beyond themselves, to which they can relate. This is the basis for many non-rational aspects of society including religion, politics and poetics.

2a. Legal (rule-based) order and negotiated order coexist in social systems

Contemporary man has much experience with what we now call legal order. We see this in public, private and religious sectors. In religion, this is seen in the reliance on an authoritative “book” such as the Bible or Koran. In science this is seen in the reliance on the most recent “scientific journal articles”. Legal ordering systems rely on leaders, laws and formalized schemas to preorder reality and divine some external meaning. This definition of external meaning may be completely artificial, possibly as a response to an absence in internal meaning that itself may also be artificial.

Legal order attempts to formalize that which can be captured and codified in prescribed rules, rules that emphasize what should not be done. Whatever is not accounted for within a system of legal order can, and generally will, create future troubles for the ordering system. As such a legal order attempts to describe, *a priori*, what may arise in the relationship and how it will be dealt with. Rules as written and administered are the center of attention and the basis of operations. Legal order rests on the foundations of command and control mandates. Legal order requires fixed procedures, and relies on the predictability found in hierarchical forms of governance. Most industrial organizations, including governments, rely on legal order.

Any legal order must be linear, clearly defined, bounded and formalized. Formalization generally abhors ambiguity. It seeks clarity at all costs, even if the results are clearly wrong. Negotiation is a different kind of process. It seeks the fluid and where it works best is part of the flow. Negotiation frustrates formality because about the only thing that can be clearly said about the fluid is that it is becoming. Negotiated order is offered as an alternative to the prevailing system of legal order.

Negotiation is part of a world often forgotten by leaders in large and mature organizations. Negotiation respects spontaneity at the edge of the present, as it is simultaneously open to being guided by ideals of an improved future, jointly created. To operate, participants must be highly motivated in intent yet flexible in direction. Negotiation rests on the presumption that people can coordinate themselves, and their interactions with each other, without an external “ruler.” For some, the key message of the negotiated order perspective is that all social orders are negotiated orders (Regan, 1984). However, this is only one part of the story. Strauss (1993) positions the two parts:

[T]he concept of negotiated order was designed to refer not merely to negotiation and negotiative processes. It also points to the lack of fixity of social order, its temporal, mobile and unstable character, and the flexibility of interactors faced with the need to act through interactional processes in specific localized situations where although rules and regulations exist nevertheless these are not necessarily precisely prescriptive or preemptorily constraining. (255).

Negotiated order should not be viewed as a virtue by itself, but instead in the light of limitations emerging from its natural enemy -- legal order. Negotiated order and legal order are each approaches better suited to quite different environments. Negotiation provides limited value in environments that are filled with predictability or are based on stability. Negotiated success is continuously defined by the conditions of the moment. Success unfolds as people are given responsibility to think, coordinate and respond in real time. Preplanned, fixed and memorized procedures represent the antithesis of negotiation, but may serve as an important stimulant to energize the need for it. Negotiation comes with a different set of attitudes, educational practices and measures of performance. The fixed positions and routines of static organizational structures can be replaced with fluid networks of people and ideas connected flexibly in a negotiated order.

2b. Businesses often exercise negotiation within a legal (rule-based) context

Negotiated order has been highlighted in past research in diverse fields such as health care and environmental protection. Its relevance to emerging problems within contemporary business is easy to see.

Scholars have long recognized that business people commonly resolve conflicts through means other enforcing contractual covenants. Evidence of a preference towards negotiated order over legal order was observed by Macaulay (1963):

Preliminary findings indicate that businessmen often fail to plan exchange relationships completely, and seldom use legal sanctions to adjust these relationships or to settle disputes. Planning and legal sanctions are often unnecessary and may have undesirable consequences. Transactions are planned and legal sanctions are used when the gains are thought to outweigh the costs. The power to decide whether the gains from using contract outweigh the costs will be held by individuals having different occupational roles. The occupational role influences the decision that is made. (p. 55)

Perhaps the most cited study in the area of negotiated order is the study of two mental hospitals by Strauss and his colleagues (1963). They sought to capture how members of various occupational groups (e.g., doctors, nurses, patients, lay workers) negotiate the meanings, routines, and tacit agreements of work against the backdrop of beliefs about the "proper" nature, goals, and methods of psychiatry. Most noteworthy in this study was that rules governing the actions of various organizations are far from extensive, clearly stated or clearly binding. It seems that hardly anyone knew all the rules, much less to what situations they applied, for whom, and with which sanctions. In addition, the personnel proved adept at breaking the rules when it suited their convenience or when warrantable exigencies arose.

In the situations described by Strauss et al. (1963), there existed a profound belief that the care of patients calls for a minimum of hard and fast rules and a maximum of innovation and improvisation. Hence, the area of action covered by clearly enunciated rules is really very small. Thus actions are governed more by shared understandings than commands. Rules that were recognized were still continually negotiated, argued, or even ignored at convenient moments. The governing principles were far from universal prescriptions without limitations to their context or application, or time frame of validity. The hospital was a place where agreements were constantly established, renewed, reviewed, revoked and revised.

Strauss (1978: ix) has suggested that even the most repressive of social orders are inconceivable without some form of negotiation. In such totalitarian institutions as maximum security prisons, staff and inmates may negotiate their own interpretation of the social order, often constructing an alternative that may be just as formal, although tacit, as that it replaces. The most fundamental, and most used, alternative form of order is legal order. It is always in the background. In the corporate arena, corporations exist within nations, so they must always be aware of the legal order of their

contexts. The laws of the state in which a business is incorporated applies to it functioning – although there are continuous efforts at bargaining to reduce barriers seen as unfavorable to commerce.

2c. Negotiating order is distinct from bargaining, with upside potential

Although the negotiating process is sometimes invoked situationally to resolve bounded issues, many of today's business executives may be unfamiliar with its potential power to bring order into the most systemically untenable contexts. Negotiation has arisen in response to difficulties in extensive reliance on the fixed features of formalization, and the processes of formal bargaining on which formal organization relies.

In its essence, negotiating order must be seen as distinct from bargaining. The interaction ritual in bargaining focuses on who gets more, and who gets less. The composite economics are held constant. With bargaining, one party may be expected to say, “what’s mine is mine but what’s your is negotiable”. This is not negotiation, but instead arrogance cloaked in bargaining. Establishing order through negotiation was relegated to a reduced role in the development and expansion of industrialization.

Negotiated order is a robust means to govern process and results where all participants can continue to seek to improve their standing but can only find success in finding creative ways to act so as to demonstrably improve the standing of others. Negotiation processes do not shy away from the long-shunned problem of the commons. In this it differs from bargaining that is based on zero-sum arguments over how to divide a fixed pie of resources. Within the negotiation schema the pie is not fixed and interaction focuses on how to enlarge it, not how to divide it. The attraction of negotiation is that the dimensions of the pie will be changed. The danger is that it will become smaller.

2e. Negotiated order enables rapid adaptation in turbulence

Many of the frictions in today's organizations are posed as minor issues of misalignment, but a growing portion of them seem endemic, arising from limitations in their systems of governance. The environment of business has become less predictable. So too have the internal operations of businesses. The drive for success has shifted attention away from parts organized in simplistic functional hierarchies, towards the interaction between parts in networked forms. Instead of controlling fixed entities through supervision, bureaucratic frictions are dissolved to improve flows through linkages. This change in orientation poses difficulties for those who focus on the understanding, use, and the performance *of* entities. Managers can not rely on fixed presuppositions, rules as written and belief in the ultimate truth of a legal order. More dimensions need to be considered, including the perspectives in which an entity connects and is connected.

The flexibility offered by a negotiation process encourages individuals to act openly in pursuit of their own interests, while learning what those interests actually are, and then allowing redefinitions of those interests, to account for the importance of larger and longer social and natural interests to which we are all intrinsically connected. This allows participants to see how fragile and tentative contemporary reality is, and that is increasingly based on networks of interests that operate as fluids. This differs significantly from seeing organizations as fixed, forceful and long-lasting locations of positions of relative authority where positions are seen as so critical to demand immediate filling of the box with an “acting” holder. While traditional organizations are set up to take advantage of the potentials of hierarchy, the clarity of fixed rules of order and predictable routines, we see how successful organizations now seem to emphasize non-hierarchical relations, revolutionary experimentation and spontaneous responses. These appear to be better suited to govern relations in environments that shift quickly and unpredictably.

A similar pattern occurs in the life cycle of a product or service. Manufacturers or service providers achieve success in innovation by matching their offerings to customer's needs at that point in time. As they strive to produce to the scale of mass markets, they lose some touch with individual customers and clients. The organization regains its value through improved customer intimacy -- which may be seen as a form of negotiated order. In the most involved relationships, negotiated order may urge the customer to adopt some responsibilities of a contributor or a co-producer, deepening the expertise and communication beyond that normally assumed by a customer in an arms' length or transactional style.

In the Linux story that follows, the network form of business operates with permeability through organizational boundaries. This permeability supports open access to parties who desire greater contributions and/or involvements in actions or their consequences. Mutual interests are served through parallel negotiation processes, at the levels of individuals, organizations, and the movement as a whole.

3. Negotiated order in a network form enables greater fluidity

The Linux community has led to a redefinition of the software business. At the center of Linux initiatives is its operating system, standing in opposition to the principles of commercial software developers, such as Microsoft. Commercial software has typically been developed with internals hidden away as proprietary secrets. In contrast, the source code to Linux is freely available, encouraging private individuals to play a role in development and enhancement of the product.

3a. Diverse customer interests are a limit for the software business

Software is sometimes described as a unique product with "increasing marginal returns": the more that customers adopt a product, the more likely that it will become a de facto standard in the marketplace, attracting even more purchasers (Arthur, 1996). It is true that the marginal cost of every digital copy of a finished product is near zero, but development of that "first release" of software can be a big bet. Software development is brutal business that is both knowledge-based and labor-intensive.

Software without hardware has no function. Software has the advantage and disadvantage that it can be continually updated and modified. If an automobile was software, customers would expect to see improved fuel efficiency and new features continually added on over its lifetime. Software written without errors is a holy grail. The release of software is an economic decision, based on statistical estimates of defects, and the estimated number of customers that will use specified features.

Writing software to support a single user is relatively cheap. Where software development costs escalate is in satisfying broad ranges of customers. There's always a competitive product that has a feature that is critical to some customer, so continued development can be directly traced to more revenue. Customers around the world will want their native languages supported, at the highest performance possible on whatever hardware platform they own. Building on the existing code base is always an incremental investment, as compared to starting over, so incumbent suppliers have advantage over newcomers.

The challenge with commercial software development is that it is founded on capitalist principles. Profits come from software companies restricting access to their intellectual property. Customers may become dissatisfied with poor product quality, but unless they are sufficiently influential, the bug that impacts them may fall as a low priority for fixing. On the other hand, customers have come to expect PC-based software priced in the \$100 to \$1000 range, and are unwilling to pay more unless they can make money off the software itself.

3b. The Linux community was founded on the satisfaction of niche interests

In 1991, a 21 year-old Finnish student of computer sciences, Linus Torvalds, purchased his first computer. Torvalds needed an operating system which could exploit the full potential of his computer, but soon found that the operating systems then available in the market were too costly or too low quality. As an alternative, Torvalds decided to develop his own operating system, based on an educational version of Unix called Minix. Torvalds consulted with fellow hackers over the Internet about some defects. Many showed their interest in his work (Torvalds, 2001; Erkkilä, 1999).

Soon, Torvalds released the first kernel of Linux (the core of the operating system) under the GNU Public License. Allowing other to focus on coding, Torvalds focused on coordination of the collective effort. By January of 1992, over 100 users had downloaded Linux and were regularly updating the source code. Early and frequent releases enabled the fast elimination of bugs, and the expansion of potential user applications (Kemppinen, 1999; Kauppinen,1995).

The first official Linux version was released in 1994. At that time, the users of Linux were mainly Unix hackers and net activists. Linux started to gain popularity among the people not familiar with the Internet. The Linux operating system then came to be distributed by Red Hat, and other distributors. These distributors contribute value-adding by assembling, testing and warranting the operating as plug-compatible with software under the same brand label (Aasarmoen, 1999, Shipley, 1999, and Palojarvi, 1999).

Science and engineering related industries have replaced high-end Unix clusters with inexpensive but computationally superior Linux clusters. With 12,000,000 users in 1998, Linux has gained a wide market acceptance, including use as a business server. Computer vendors such as Apple, Compaq, Corel, Dell, Hewlett-Packard, IBM, Intel, and Lotus now support Linux (Littman, 1999).

3c. Attitudes and motivations contrast to commercial software development

The open source approach to software development the underlies the Linux community can be contrasted to the tightly-managed projects common in commercial enterprises. Table 1 summarizes points described earlier, on ways in which the business system of commercial software development has reached its limits.

Table 1: Linux as a response to a business system reaching its limits

Business system	Indicators of the business system reaching its limits	A reformed design with features of negotiated order
Commercial software development	<ul style="list-style-type: none"> • Bottlenecks on defect reduction and feature development • Demands to support multiple national languages and various platforms • Prohibitive costs to market entry 	<ul style="list-style-type: none"> (i) Ambiguous path and priorities (ii) Decentralized authority (iii) Monetary and non-monetary forms of capital exchange (iv) Co-producer roles

The key features of the Linux community, as a business system, listed in Table 1 are described in greater detail, below.

3c(i). Priorities and the path from now to the end state are ambiguous

Software development in commercial enterprises are planned, with schedules often driven by economic considerations: if releases are timed too frequently, customers will be frustrated at having to pay for upgrades; if releases are timed too infrequently, customers may switch to alternative products that have desired features. The planning orientation of commercial software development encourages the promotion of "new" or "improved" versions. Customers are encouraged to upgrade to the current version, and obsolete editions are no longer supported. Development is typically "timeboxed", with enhancements prioritized and scheduled. With a known end product and time frame, development projects can be analytically managed with a calendar (and stopwatch).

Linux, on the other hand, is understood as a product that is continuously developed (Sibley, 1999; Raymond, 1999; Moody, 1997). Older releases that have proven to be reliable (although lacking features introduced later) continue to be generally available. Linux allows room for uncertainty. The "lateness" of delivery of a release (e.g. version 2.4) is sometimes noted in the press. Each Linux user takes responsibility for its future by being in a part of the engineering team. Before a release is officially sanctioned for shipment, however, developers continue to test and fix the product until it is considered to be reliable. This attitude does not mean that development is haphazard or not conscious of time. It does reflect, however, that developers know that the unexpected can and will happen, and that such delays should not influence the quality of the end product.

3c(ii). Authority is decentralized and largely self-managed

Commercial software development that follow good practices in project management spend a significant amount of effort on developing specifications, estimating required effort, defining roles and tracking progress. Project managers may or may not have authoritarian styles, but are responsible for ensuring a project stays on track. Formal titles are recognized, and senior and junior positions are well understood. Most developers are expected to come into a shared centralized office, and it is not uncommon for hours to be tracked (for productivity metrics, if not for compensation).

Linux developers are scattered around the globe. Contributions of code can come from full-time corporate employees (e.g. working for IBM), independent contractors with special expertise, or even from students. Individuals can volunteer for tasks associated with their particular interests. If a team has already been formed and is fully staffed, the volunteer may be directed to another initiative where skills can be appropriately applied. Activities are negotiated and coordinated within teams, without supervisors. There is no human resources function that hires and qualifies developers. Coordination takes place on a peer-to-peer level. Over time, software developers accumulate a reputation for competence and/or compatibility when working in distributed teams (Moon and Sproull, 2000).

3c(iii). Monetary and non-monetary forms of capital exchange are recognized

Commercial software development runs on financial capital. Success means a product that is developed on time, on budget, to specifications that mean success in the market. In Silicon Valley startups, developers often seek to convert "sweat equity" in financial rewards by earning modest salaries, in the hopes that the options rewarded to them will make them millionaires.

A developer on a Linux team will never be a millionaire, unless he or she makes a fortune in another way. The terms of the public license make it clear that contributions of code become seamless parts of the Linux products. Effort may be acknowledged in documentation, but the true recognition generally comes from peers who can appreciate the contribution (Moody, 1997). It is not uncommon for independent software developers to volunteer in the Linux community, as a way to establish credibility for a paying job in other contexts. As an example, a security specialist who

contributes key components to Linux is likely to have little trouble finding companies who wish to keep hackers at bay.

3c(iv). Customers and suppliers become co-producers

In commercial software development, it is always clear who is the customer: he or she is the one footing the bill. This gives one party power over the other, in an asymmetric relationship. On the other hand, the supplier may choose to serve or not serve a particular client, depending on whether the product is completely proprietary, or has close substitutes.

In the Linux community, it is not uncommon for an individual to develop some functionality for his or her own purposes, and then release the code into the public license (Stallman, 2003). The original developer may gain some benefits if the code is improved by someone else in the community, but his or her efforts may be totally superseded by a better alternative. In the open source approach, if the original supplier is uninterested in further work on his or her code, a more motivated individual can pick up where the originator left off. Eventually, when everyone is using someone else's code, and is modifying the work of others, the distinct roles of customer and supplier become less important.

In his 1999 essay, "The Cathedral and the Bazaar", Eric Raymond compares the proprietary commercial software development to the open source approach of Linux. A cathedral is "carefully crafted by individual wizards or small bands of mages working in splendid isolation, with no beta to be released before its time". In contrast, "the Linux community seemed to resemble a great babbling bazaar of differing agendas and approaches... out of which a coherent and stable system could seemingly emerge only by a succession of miracles". Releasing early, delegating everything possible, and allowing the community to examine every detail represents an alternative way of reaching a high standard of quality. In the next section, parallels between a bazaar and negotiated order should become obvious.

4. Negotiated order is leveraged in traditional industrial business

Critics of the negotiated order view might argue that the Linux community is a "special case" in business, since software development can occur in a decentralized, "virtual" space. In addition to that example, we can find features of negotiated order in some businesses along more traditional industrial lines. Table 2 outlines business systems for (a) home furnishings manufacturing and distribution, (b) encyclopedia publishing and (c) outdoor sporting gear and apparel retailing.

Table 2: Examples of traditional industrial business systems reaching their limits

Business system	Indicators of the business system reaching its limits	A reformed design with features of negotiated order
(a) Home furnishing manufacturing and distribution	<ul style="list-style-type: none"> • Low inventory turnover requires high markups • Expensive to ship and deliver • Shopping experience requires intensive search 	<ul style="list-style-type: none"> • Matched product assortment custom designed and built by contractors • Catalog shopping "at home" convenience, then pick up at warehouse • Consumer deliver and assemble own knock-down furniture, reducing cost

(b) Encyclopedia publishing	<ul style="list-style-type: none"> • Collecting and verifying information is labor-intensive • Corrections and revisions are slow 	<ul style="list-style-type: none"> • Open content, editable by any registered contributor over the Internet • Reversion procedures for the few entries considered counter-productive • Clear protocols for dispute resolution
(c) Outdoor sporting gear and apparel retailing	<ul style="list-style-type: none"> • Specialized products expensive and difficult to find • Ethical consideration for the ecologically-minded 	<ul style="list-style-type: none"> • Co-op ownership structure with \$5 membership fee • Private label products, catalog, plus retail stores • Leading environmental advocacy

While these businesses are not without a legal context, they have demonstrates some movement towards features of negotiated order. They each have embraced the permeability of organizations at the perimeter, with traditional gatekeepers roles at the center reduced or reversed to bridge the boundary gaps and enable freer access. The role of the individual actor in the formation and evolution of these organizations to represent a community of interest is noteworthy. Each from Table 2 is described in greater detail in the sections that follow.

4a. The home furnishings industry reached limits in costs and convenience

For nearly three-quarters of the 20th century, the home furnishings market remained largely unchanged. The industry was following an approach of legal order, planning and distributing furniture in a style that could be described as "make-and-sell" (Haeckel, 1999).

Small manufacturers near choice stands of hardwoods employed shops of woodworking craftsmen to hand assemble home furnishings such as dining room tables and bedroom chests. These bulky items were then shipped to a small number of chain retailers, and a large number of independent retailers. Furnishings are generally purchased by homeowners infrequently, with periodicities in the decades. Slow turnover in inventory required relatively high margins to keep the industry in business.

From the consumer's perspective, this business system reached its limits in economic viability in the 1980s. As the baby boom generation became dual career couples, their budgets for consumer durables became squeezed. In addition, in a time-starved schedule, shopping for furniture was inconvenient and took too long. Finding pieces that would match a particular style either entailed entering an order into the backlog of a particular manufacturer, or visiting multiple retailers to see what they had in stock.

4a(i). Ikea became designer / distributor, with consumers as co-producers

The now famous IKEA catalogue was first published in 1950, when Ingvar Kamrad first sold furniture from his farm called Elmtaryd in Agunnaryd, Sweden. Five years later, specially designed IKEA furniture was produced in pieces to facilitate storage and shipping. Consumers followed a two page instruction sheet to assemble the final product at home.

For the consumer, Ikea has practically cornered the market in value-priced furniture. The company provides broad assortments of coordinated furnishings that can be mixed and matched to the immediate needs of the consumer's apartment or home. Time is conserved as consumers can browse through a catalog (and now a web site) to check styles and dimensions, and then make a single trip to pick up his or her selections. Flat-packed furniture components help to reduce shipping costs, and packages are designed to be transportable in cars or minivans. It is feasible to furnish an entire house -- of any size -- from the product selection available at a single Ikea store.

Ikea illustrates a systems perspective that is consistent with the negotiated order approach. The company primarily plays the role of the distributor, negotiating relationships between designers, producers and suppliers of furniture components, in an end-to-end integration. This integration includes consumers, who are co-opted with delivery and assembly activities, thereby becoming co-producers of the product. Ikea has now grown to 157 warehouse stores in 29 countries (Stodola, 2003).

4b. Encyclopedia publishing reached limits in economics and revising

Diderot, in publishing the *Encyclopédie* in 1745 France, is often cited as the one of the last individuals to "know everything". By outlined the current state of knowledge about sciences, arts, and crafts, he made knowledge possessed by the few accessible to the many. This may be compared to development of the *Oxford English Dictionary*, that started in 1879, with the first edition finally published in 1933 -- 18 years after the death of the first editor. Maintaining this body of knowledge represents a cycle measured in decades.

In today's world, the exponential advancement of knowledge has seen traditional methods of encyclopedia development reach its limits. No matter how many researchers and writers are assigned to the staff, content will come in at a rate greater than the ability to check and update the entries.

4b(ii). Wikipedia empowers individuals to contribute and validate entries

The Wikipedia is a free Internet-based encyclopedia started in 2001 that follows the GNU public license, previously cited as a foundation of Linux licensing. Originally started as an Internet startup project by Jimmy Wales and Larry Sanger, it was based on Wiki software that allows anyone to register and edit entries to selected web pages. The initiative was transferred, in 2003, to a not-for-profit institution called Wikimedia (www.wikipedia.com).

The Wikipedia approach is to allow all Internet users to contribute content, assuming that the largest majority of people are honest and conscientious. If an individual locates content which is considered wrong, he or she has the power to edit the page to correct the inaccuracy. Prior entries are automatically preserved, so that later editing can be reversed. Abusers can be banned by various means (e.g. blocking of IP addresses).

Contributors are encouraged to maintain a "Neutral Point of View" in the pursuit of entries that are relatively free of bias. The seriousness of maintaining order through negotiation is explained at length in entries on the "power structure" of Wikipedia, referring to anarchy, despotism and technocracy. Wikipedia is clear not only on its strengths (e.g. wide accessibility, rapid growth in content and continual updating) but also its weaknesses (e.g. overemphasis on popular topics while obscure subjects are underserved, inconsistent writing styles and lack of graphics). The ongoing success in governing the content of Wikipedia may be observed by anyone with access to the Internet.

4c. Outdoor sporting enthusiasts were underserved by local retailers

In British Columbia, Canada, a number of recreational mountaineering enthusiasts were frustrated at the inability to locally purchase sporting gear. When Canada Customs officials were thought to be monitoring license plates at the Seattle REI store, six individuals decided in 1971 to incorporate a cooperative specializing in outdoor equipment.

4c(i). Mountain Equipment Co-op leads in social and environmental advocacy

MEC is a designer, manufacturer, and retailer of outdoor gear. The organization is a co-operative, owned and directed by its members, with 5 stores across Canada and a global mail order operation. With a \$5 shareholder fee, it has 2 million members -- approaching 10% of the Canadian population.

MEC not only is reputed as a good employer, but has followed through on its vision of action for a healthy planet. In its Old Growth Policy, it designs products and selects suppliers that prefer recycled fibers, and has been phasing out products that endanger old growth rainforests. In the construction of new retail stores, it has designed "Green" buildings that meet standards on energy efficiency, minimal environmental impact, occupant health, comfort and functional performance. The Ottawa store was the first retail building to comply with Canada's C2000 Green Building Standard.

In support of negotiated order, Mountain Equipment Co-op demonstrates that businesses can not only satisfy the minimal legal requirements, but can reflect the larger values of their constituents.

These three additional examples suggest that the Linux movement may not be a unique case where negotiated order is now playing a larger role in business. Escaping the limits imposed by legal order may be an attractive shift in governance to be considered by businesses of all types that are feeling constrained.

5. Should a business system shift towards negotiated order?

The examples described above illustrate businesses that have rebalanced their governance towards negotiated order. These examples are all successful businesses that have unique cultures at their core. For businesses that are currently oriented towards a regime of legal order, the feasibility of reorienting towards negotiated order is considered in three closing sections:

- (a) When is negotiated order most needed in a business system?
- (b) What role does leadership play in aiming beyond the limits of its current business?
- (c) Is there a risk associated with adopting a negotiated order approach?

These questions deserve deeper investigation, and are more speculative areas to be validated in potential future research. The spirit of these closing thoughts is to encourage the reader to consider taking action beyond the limits of legal order.

5a. Negotiated order may be best at extremes of simplicity and complexity

The focus of this paper has been primarily on mature businesses, where legal order has resulted in complexity that is stifling to adaptation. Under these conditions, negotiated order is seen as way to revitalize the business. However, in a life cycle of view of business, negotiated order is probably the way in which most organizations start up. Figure 1 illustrates a conceptual view of the balances between negotiated order at legal order, over time.

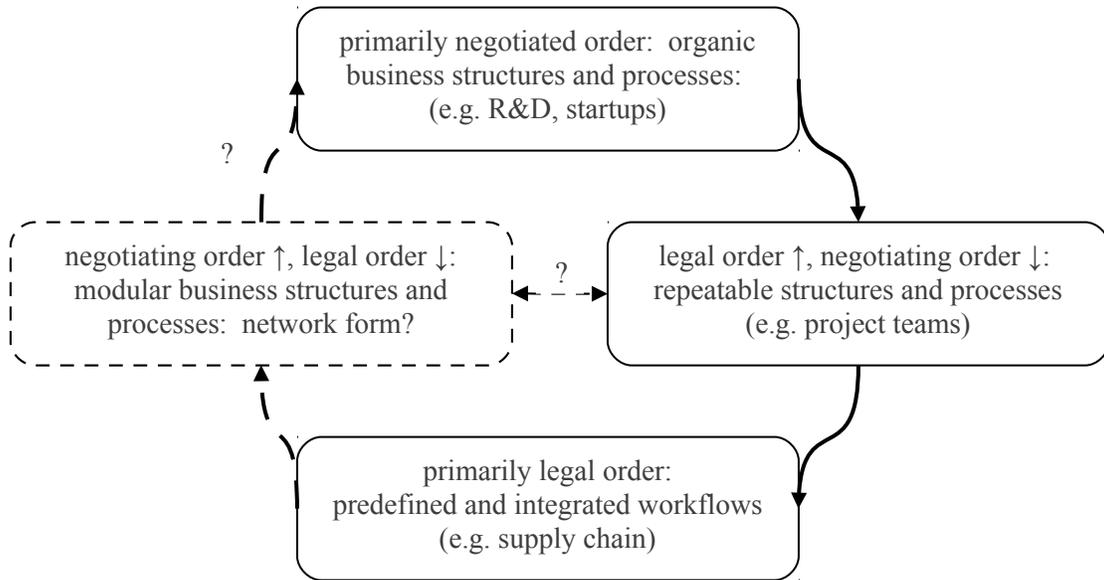


Figure 1: Changing emphases in negotiated order and legal order

In this frame, three phases can initially be plausibly described:

1. Primarily negotiated order: When organizations are small, and still in the formative stages of development, organizational structures and processes are organic. In the classical Silicon Valley garage startup, the technical and business roles are mixed, and individuals mutually adjust to get whatever is required, done. As the organization grows in size, and its administration becomes unwieldy, the next step may logically be towards a more legal order.
2. Emergence of a legal order: The role of a formal order becomes prominent while the role of a negotiating order becomes secondary. In order to commercialize an invention, repeatability (often as mass production) requires organizational roles be clearly defined, and handoffs from one party to another be codified as processes. Reporting and communication lines are relatively straightforward, with clear articulations of project teams or functional divisions. In effort to create greater efficiencies, the business may enter ...
3. Primarily legal order: Herein there is an effort to define the heuristics as well as rules within and between organizations so that the supply chain flows efficiently. Herein, industrial engineers may be called into perform time-and-motion studies to find the "one best way" to use resources.

In this third phase, one of the great potential risks is creeping bureaucracy and ossification. Greater efficiency can be achieved by narrowing the scope of offerings and activities. The full range of customers and constituent interests may not be served, and/or product assortments may be reduced.

The fourth phase is posited as a continuation in the life cycle.

4. Re-emergence of a negotiated order: We believe that the network form organizations described earlier may represent a fourth phase: a phase where negotiated order becomes prominent and legal order returns to a secondary status. Therein, the design, structure and process are modular and may be reconfigured in a number of ways, to suit the situation at hand.

The focus turns from these formal aspects within and between organizations to the broader context and ways to appreciate to where it is going. In this analysis, three aspects are uncertain:

- It is not clear that this is a closed loop, and the phase where negotiated order rises and legal order falls will lead to a system where negotiated order predominates. It is possible that the

successful network form organization must be so adaptive that it needs to shed most of the constraints of legal order, but this is not a certainty.

- It is not clear whether the arrows should only lead one direction, or whether they can be bi-directional. As an example, once a garage shop operation becomes a viable commercial competitor, it's not clear that they can return to their origins.
- It is not clear whether it's possible to short-cut the loop, and consciously choose more negotiated order before the legal order turns into bureaucracy. Establishing rules requires bringing certain personality types into an organization, who may not appreciate reducing controls and loosening monitoring.

5b. Leadership through negotiated order is an alternative to charisma

In popular business magazines, business that survive traumatic change are often portrayed as being saved by a charismatic leader. A style of negotiated order should not begin and end with the regime of an individual.

In two of our examples, charismatic individuals clearly initially led their organized in a spirit of negotiated order. The influences of Linus Torvalds or Ingvar Kamrad should not be diminished, but the proof lies in the durability of continued success of these businesses. Entrepreneurism can create new linkages that allow the business to flexibly evolve and grow over time. As the business matures, however, centering on original founders can represent a static element that is complementary to legal order.

Negotiating order recenters attention from individuals (or nodes) in a network, towards interactions with other parties. Linkages to suppliers or to customers can gradually be transformed into co-producing alliances. In an alternative view, these organizational systems initially succeeded by incrementally extending the structures on which they were germinated. When performance of the enterprise plateaus, the way forward is brought into question. A systems view of business requires more than heroic leadership.

5c. Negotiated order does not establish a permanence as does legal order

Some benefits and risks associated with establishing greater order are depicted in Table 3 below. The impacts of taking appropriate and inappropriate actions are outlined.

Table 3: Benefits and risks of approaches to establishing greater order

		Action required	
		Greater legal order	Greater negotiated order
Action taken	Greater legal order	Improved conformance to the terms and conditions specified	Reduction of the potential value creation and capture to lowest-common-denominator terms
	Greater negotiated order	Situated actions don't get generalized, so responses are inconsistent	Pursuit and capture of unforeseen new opportunities as they arise

On the side of appropriate action:

- When greater legal order is required, and greater legal order is established, performance in the business system should be improved, through better conformance to specified terms and conditions.

- When greater negotiated order is called for and greater negotiated order is established, unforeseen events should be better handled, due to improved alertness to the current condition or situation.

On the side of inappropriate action:

- When greater legal order is required and greater negotiated order is attempted, immediate issues may be resolved, but responses may not be systemic. Greater efficiency and greater consistency may be achieved through establishing greater legal order.
- When greater negotiated order is called for, and greater legal order is attempted, opportunities may be lost through rigidity. In long-term inter-organizational relations expected with the network form, parties should be open for potential benefits unforeseen at the outset of collaboration.

The challenges of instability from conditions of ambiguity are not trivial. Organized entities, by their nature, seek stability as a basis for operations. Sometimes a social group prefers an enforced wrong stability to await a more appropriate one to emerge. More innovative and flexible ways are needed to respond to the resulting ambiguity. In a word, we need to learn to better manage that which appears fluid. We argue that this need is met with systems of negotiated order.

6. Summary and Conclusions

This paper contributes a systemic understanding of business governance by examining cases where businesses have reached their limits. In particular, we have compared features of legal order and negotiated order with a specific focus on turbulent environments. We close the discussion by reviewing the larger context of negotiated order, and suggesting that 21st century businesses should adopt a more positive attitude towards this approach.

6a. Negotiated order is not new, and deserves greater emphasis in business

The ideal of having responsibility for self in social settings dates back to the ancient Greeks. Aristippus, Zeno and some early Greek libertarians motivated others to action. These same ideals are later indicated in the writings of philosophers of the Age of Reason, such as Voltaire, Diderot, and Rousseau. These philosophers resented the abuses of authority and played with the notion of a society without a government. "Humanly devised laws, not being a product of wisdom, but a result of fear and greed, should be annulled and replaced by the decisions of reasonable men" (Madison, 1928).

Peter Kropotkin, a cultured and persuasive advocate of revisiting the anarchist ideal of the ancient Greeks, defined the agenda as "the most complete development of individuality combined with the highest development of voluntary association in all its aspects, in all possible degrees, in all imaginable aims...which carry in themselves the elements of durability and constantly assume new forms which answer best to the multiple aspirations of all" (Kropotkin, 1927). He believed that there is a natural order to the social as well as the physical world, and he wanted to build a society in which man can live according to these rules of nature (Mason, 1945)

Kropotkin perceived the physical world as self-regulating, where society has the capability to self-adjust. He played with the concept of natural order as an alternative to external social authority and as a platform to raise the importance of the judgment of the individual. This is related, but quite different to the spontaneous social order proposed by Hayek. Hayek describes an order that emerges in social life without conscious reflection or planning. This spontaneous order thesis may be related to principles of self-organizing and self-replicating structures that arise without design or even a possibility of design, but it can still lead to orders that become fixed (Gray, 1948). The human

fixation on the fixed seems at least as strong as the urge to be free. The importance of our argument is to stay with the fluid even though there is always the possibility to go towards the fixed or the fixing of the fluid. This is in part due to the spontaneous nature of the reality with which we deal, where we bring radical ignorance into each situation.

The spontaneous social order to which Hayek refers can, in fact, organize and utilize fragmented knowledge dispersed among millions of people while a planned system only becomes frustrated with that which does not appear to fit. Hayek's examples of spontaneous social order are: law and morals, language, market and monetary systems. Additional spontaneous orders are seen to emerge in natural processes, such as the formation of crystals and even galaxies (Gray, 1948). Using the term spontaneous for some of the above largely misses the point of self-organizing systems and the contexts from which they emerge. Promulgation and implementation of laws and morals are perfect examples of the tendency to fix that which is fluid, and to formalize the informal emergence of reality. Many things can, and perhaps should be, fixed, but those are not the subject matter of this paper and the research that lies behind it.

6b. Negotiated order is evidenced in industrial and network form businesses

The four cited examples of businesses illustrate that negotiated order is a workable approach. The Linux community began as a student project, evolved to a rag tag group of hackers, and has matured to gain the respect of large scale commercial providers (e.g. IBM). IKEA demonstrates flexibility in its modular design; its integration of designers, suppliers and manufacturers; and its co-opting of consumer with delivery and assembly activities. The Wikipedia has enabled rapid growth in freely accessible knowledge over the Internet, with volunteer contributions beyond a select elite to a larger global community where personal expertise of individuals can be tapped. Finally, Mountain Equipment Co-op has not only satisfied the product needs of its members, but also leads in social and environmental advocacy, reflecting the core social values of its constituents.

Negotiated order should not be viewed as a virtue by itself, but instead in the light of limitations emerging from legal order. Increased emphasis on negotiated order provides limited value in environments that are filled with predictability and stability. Instead, it can be seen as a response to complexity and turbulence in today's business environment in both network form and traditional industrial organizations. We also suggest that businesses may experience changing emphases in negotiated and legal order over their life cycles.

We conclude that systems of governance oriented towards legal order are will be unable to keep pace with rapid change in 21st century businesses. Fluidity will be a key feature for success. Response and adaptation to conditions of discontinuous change has long been a concern of general systems researchers, and specifically a challenge to systems scientists with an interest in business. Greater attention to strategies involving negotiated order may help to improve the sustainability of businesses, in function, if not in form.

Appendix. Environmental conditions suggest different approaches to order

As a supplement to the discussion on turbulent environments, the other causal textures defined by Emery & Trist (1967) are reviewed, in the context of legal order and negotiated order. In particular,

- How do legal order and negotiated order perform under various organizational environments?

In the evolution of a business, negotiated and legal orders are means by which one organization will coordinate with another at various points in time. It is possible that the increasing relative emphasis on one means, over the other, may be appropriate relative to changing points of development in the maturity of an organization, or relative to changes in an environment. Table A1 characterizes the

approaches to establishing greater legal order or negotiated order under varying environmental conditions, and resulting considerations.

Table A1: Responses to establishing order under various environmental conditions

Environmental conditions	Approach to establishing greater legal order	Approach to establishing greater negotiated order	Considerations about legal order vs. negotiated order
(i) Placid	No-fault insurance: our group can each act independently of your group, and when conflict occurs, recourse will follow a predetermined schedule	Worry about it later: we can each act independently, and if conflict occurs, recourse will depend on the situation	If the cost associated with damage is catastrophic, legal order may reduce anxieties; if the cost associated with damage is insignificant, negotiated order works
(ii) Placid-clustered	Divide-and-conquer: we can map out the territory for your group and the territory for our group	Conflict avoidance: if we see each other in the territory, we'll work out which group should stay and which group should go	If the world is big, negotiated order works; if the world is crowded, legal order reduces conflict
(iii) Disturbed-reactive	Joint forces: we can create a joint list of enemies and work together	Opportunistic aid: if one group is in trouble and the other party is nearby, the other party will help	If the number of potential enemies is high, legal order enables preparation; if threats are low, negotiated order tailors to the situation
(iv) Turbulent	Build up the dike: when a flood is imminent, we can band together to fight against nature	Put out to sea: when a storm is imminent, we can take the ships away from shore and each other	If the biggest threat is from sources external to us, legal order ensures we handle everything; if the biggest threat is us smashing into each other, negotiated order ensures we're appropriately spaced apart

Each of the approaches in Table 3 has been depicted in the sense of a network form, which is thus applicable both in the context of two sister organizations, or two parties operating at arms' length.

(i) Under placid environmental conditions:

- establishing greater legal order can be likened to "no fault insurance". Each group acts independently, but conflicts and collisions are forecast in advance, and recourse is established at predetermined rates. In contrast,
- establishing greater negotiated order is a "worry about it later" approach. Interactions from independent action are presumed to have inconsequential or minimal impacts, and can be worked out (if necessary) when an incident occurs.

The tradeoff between the two approaches depends on expected impact. In a placid environment, the population is generally considered to be so sparse that an approach of negotiated order would be sufficient. Catastrophes of the type that "Lloyd's of London" would insure (e.g. an actor breaking a leg) are possible, but rare.

(ii) Under placid-clustered environmental conditions:

- establishing greater legal order is a "divide and conquer" (or segmentation) approach. Rules are defined for "territories", so that each party can independently prosper. In contrast, ...
- establishing greater negotiated order is a "conflict avoidance" strategy. Both parties understand that they do not benefit by direct conflict, and steering clear of each other by line of sight is possible.

The efficacy of one approach over the other depends not only on environment conditions, but the size of world relative to competitors. In a crowded world, the definition of boundaries reduces collisions. In vast world, the need to negotiate order would be rare.

(iii) Under disturbed-reactive environmental conditions:

- establishing greater legal order means "joining forces". The enemy is greater than each party can handle individually, so it is in mutual interests that an alliance is struck in advance of an expected engagement. In contrast,
- establishing greater negotiated order means "opportunistic aid". If one party is in trouble and the other is nearby, the moral obligation (or altruistic action) is to offer to help.

If mutual enemies are well known and at hand, legal order would seem to provide more security. Every contingency is unlikely to be foreseen, however, so negotiated order is always at least in the background.

(iv) Under turbulent environmental conditions:

- establishing greater legal order can be likened to "building up the dike" as a storm approaches. Through mutual efforts, our probability of survival is higher. In contrast,
- establishing greater negotiated order is like putting boats "out to sea". Boats that are tethered together have a greater risks of damage by smashing into each other, than by floating independently in a large body of water.

Legal order is a better bet when the threat is external. Combining forces provides greater mutual resistance. When the threat internally is greater, however, a watchful eye at every moment is more effective than a plan that doesn't work.

The above conditions illustrate that no one strategy is appropriate in all environmental conditions. Our focus has primarily been on turbulent environments, where a business system has reached its limits and mostly disintegrated into parts. Across the four causal textures, however, if only one direction were possible, negotiated order provides the more resilient response. Legal order is rigid. Negotiated order may not, however, provide the most efficient use of resources when environmental conditions call for an orientation weighted towards legal order.

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