Draft #4

Strengthening Organisation and Management of Intellectual Product Businesses

Essential insights for all involved with the leading edge in finance, biotechnology, communications, software and other knowledge-based sectors of the economy.

WARREN KINSTON

Another application of The Technology of Common-Sense®

Please note that this is a draft version subject to constant revision and improvements. Amendments may be made at any time without notification.

Published and distributed by
The SIGMA Centre Ltd
29A Netherhall Gardens
London NW3 5RL, U.K.

Tel: +44-020-7794 2445
Fax: +44-020-7431 3726

TABLE OF CONTENTS

THE INTELLECTUAL PRODUCT BUSINESS

We are witnessing the emergence of a new type of business: the intellectual product business (or IPB). The IPB is not synonymous with technology or innovation because since the invention of the wheel technologies have spawned inventions and innovations.

Driving IPBs is the latest new technology based on the microprocessor. All technology harnesses and releases power. Microprocessor technology is unique because, unlike the steam engine or electricity, the power released directly supports and facilitates intellectual processes.

The intellect feeds off data, information and knowledge. Computerisation has permitted unbelievably rapid, accurate and cheap organisation, storage, retrieval, analysis, systematization, and simulation in this domain.

Human power can now be leveraged with consequences that are still barely imaginable. Industries which are spawning IPBs are to be found in communications, finance, pharmaceuticals, software, management consultancy and elsewhere.

> Examples of intellectual products include: discovery of an orally absorbable molecule to replace an injectable one like Epogen (annual sales over $1 Bn); construction of a system predicting currency movements from price data (annual safe profit growth 30%); development of software to enable micro-payments over the Internet (value as yet undetermined); production of a tool to speed strategy development in businesses (as yet unexploited).

Of course discoveries and inventions like these could, in principle, be developed within large conventional organisations. But, in practice, they rarely are. Even when they are, the output is systematically ignored. For example, most of the major information technology discoveries (laserprinter, graphical user interface, the mouse, ethernet) were initially made at PARC (Palo Alto Research Centre), a research centre set up by Xerox. But Xerox missed them all.

The explanation relates to the distinctive type of work involved in IPBs, the distinctive type of people attracted to them, and the distinctive form of organisation required.

Comparing IPBs with Conventional Businesses (TPBs)

Conventional businesses deal with tangible products and services. In tangible product businesses (TPBs), organisation-and-management flows from the need to employ increasing numbers of staff and extensive fixed assets. Such businesses depend on physical activities and the manipulation of concrete things. Thinking occurs, to a greater or lesser extent, in planning and design stages, in developing procedures and devising systems, in monitoring results and in managing expenditures. Thinking is also required to determine a vision for the company and viable business strategies. But thinking often plays second fiddle when action is called for. Action is driven less by thinking than by reflex responses, old habits, pressures for conformity, compliance with others, taking the easy course. In TPBs, outputs of thinking are never an end in themselves. Such thinking, as an exercise of value in its own right, is confined to R&D departments and suggestion boxes.

The idea that products of thinking could be an end in themselves, could sustain businesses in their own right, is the new phenomenon and one that is barely understood amidst all the talk of the new economy and knowledge industries.

The conventional notion is that products of thinking, like inventions or scientific discoveries, only become valuable once they are commercialised. In this familiar world, thinking is simply the first stage, because the real work and the real profits lie in production, in distribution, in marketing, in selling. With all this baggage, too much thinking is perceived as dangerous. Businessmen rapidly learn that anything new is risky and unproven and that incremental improvements are safest and best. Such attitudes remain because they are largely correct for TPBs.

By contrast, in the new world of IPBs, the intellectual product is essentially complete as soon as it has been properly articulated and validated. Its value is awesome. It does not have to go to mass production. It follows that organisation and management in IPBs will show marked similarities across sectors, and marked differences from TPBs in the same sector.

Experts, who have noticed some of the differences, have tended to argue that they reflect a cultural shift in management and apply to all businesses. One example is the abolition or drastic reduction of hierarchy, especially middle management. Appreciation of the fundamentals suggests that TPBs need hierarchy and middle management as much now as ever.

> Many seem to confuse IPBs with their sector labels. In biotechnology, for example, there are true IPBs whose value is geared to their capacity to discover. But there are many other businesses in the biotech industry which are simply applying recipes by using already discovered techniques, or are supplying the industry with necessary equipment or consumables. Such businesses may be small or large, but they are conventional TPBs. Similarly, only those companies that produce browsers, that develop e-commerce tools, that enable internet telephony and the like are true IPBs. Many internet or dot.com businesses are not fundamentally different from conventional businesses—they buy or license intellectual products in order to perform everyday business tasks like communicating or selling using the new medium.

The Intellectual Product

The intellectual product takes many forms including: a written account, an investment strategy, a software program, a model of a dynamic system, identification of a useful molecule. An intellectual creation, i.e. the invention or discovery and development of that product, is a form of research inquiry. The process involves study, learning, hypothesis development, testing, validation, tolerance of uncertainty, openness to knowledge from many sources.

Success is potentially ephemeral in that once people know about the product, they can copy it with relative ease. For example, duplicating software that has taken years to develop can be done in minutes, requires no specialist knowledge, and costs almost nothing. In many fields, an imitator may get a tremendous advantage and lessening of risk from hearing that success is possible and from perceiving the broad outlines of the approach used. Reverse engineering is often possible. Copyright of text and patents offer only limited protection. In many situations, secrecy is chosen as the best option: e.g. finance companies often proclaim their use of in-house ‘proprietary technology’.

Supporting Infrastructure

Any business must manage a range of mundane activities which provides their infrastructure: accounting, personnel administration, legal compliance, maintenance of physical facilities, computing. In an IPB, as much as possible is out-sourced, not simply to gain efficiencies of scale and proficiency (as might apply in a conventional business) but also because such work is sharply different in kind and demands a radically different mentality if it is to be done well.

Long before outsourcing was fashionable, conventional businesses contracted out their advertising. Creative thinking and attunement to society, so essential to effective advertising, was simply unnatural in bureaucratic environment of a TPB and creative staff could not be adequately sustained and supported.

IPBs are an example of the same phenomenon. It is a result of a mixing two discrete responsibility and language systems: on the one hand commercial activity, and on the other, research inquiry. Other mixtures can be found e.g. societal product businesses (SPBs) like newspapers, and artistic product business (APBs) like musicals. If such complex businesses become large, they need to be organised with a split down the middle: the activity mechanics and commercial infrastructure are run by a chief executive (labelled as such or with a special title like producer or impresario), working in parallel with a specialist supremo (called, say, an editor-in-chief or artistic director) who provides the substance of the business. Organising and managing the supporting infrastructure more or less follows the rules and principles that apply to conventional businesses.[1]

Intellectual products can be generated by conventional businesses in their Research & Development Departments. Although large companies are capable of absorbing costs and risks of creating new technologically advanced products, they are reluctant to support such endeavours. R&D typically ends up altering trivial features capable of intensive persuasive marketing, rather than producing the genuinely new. Large companies in any field have to keep their technology up to date but they have investments in the status quo and have top management socialized into holding dominating positions in existing markets rather than creating new markets or (worse) destroying their own markets with new products. Two well-known examples are IBM and RCA: for far too long, IBM headquarters staff saw personal computing as a threat to their mainframe business rather than as a wave of the future; similarly, RCA suppressed its own employee's invention of liquid crystal displays (LCDs) because it threatened its cathode ray tube business.

.

INTELLECTUAL WORK

The Emergence of Intellectual Work

The potential capacity of individuals has always been far higher than societies have been prepared to attribute and foster. Societies are organised according to power. Power only grudgingly recognizes ability, and even then remains preoccupied with retaining dominance. So it is not surprising that literacy used to be something for the elite alone.

[1] The rules and principles of organisation and management are poorly understood partly because of the dominance of fashionable fads, partly because relevant academic research has not itself had to function as an IPB.

Ignorance amongst the masses was then fostered and exploited by the educated within the church and ruling classes. Once it became clear that all could learn to read and write, education was restricted to the wealthy and powerful while children were expected to work to support the family. Slowly education was expected of all, but only the elite were given the privilege of university life. The age of leaving compulsory full-time education slowly rose to meet the economic demands of society. Still, even among those going to University only the elite were expected to engage in research. Then over the past half-century a transformation occurred. Knowledge and inquiry suddenly became relevant to all vocations in all sectors. Universities exploded in number and the majority aspired to attend them. At the same time, inquiry started moving out into the world: initially within research-and-development departments of large firms.

With the emergence of the IPB, true investigative inquiry has leaped into everyday life and become commercially viable. By becoming part of the economy, research inquiry tapped into the fundamental human drive to make a living. It started being driven by pragmatic imperatives rather than academic codes.

Distinguishing Academic Inquiry and Commercial Inquiry

Research inquiries within Universities are governed by the academic discipline within which they are conducted. Such disciplines have a history and continuity. They operate by consensus and build up knowledge progressively. Periodic revolutions in underlying paradigms are generated by a cumulating pressure to resolve widely recognized persistent anomalies. In short, disciplines develop through studying their own output—not by studying the real world directly. The real world must be perceived and studied through currently accepted concepts, theories and philosophies within the discipline. If not, the research output is dismissed and the investigator's disciplinary career is cut short.

Inquiry which takes place in the real world may draw on disciplinary tools and knowledge, but it obeys the imperative of the market. The market is pragmatic and opportunistic: does the product generate a massive operational or strategic benefit in practice? Anything new is risky, but if the reward is massive, the risk may be worth taking. When we consider IPBs, we commonly find that the market being penetrated or developed is often measured in billions of dollars.

> Electronic information storage and display enables easy near-costless modifications but lacks the convenience of the printed page. Printed material however cannot have even a sentence altered without cost and trouble. Recently an IPB has developed a method of producing electronic paper in which electric fields alter the appearance of letters on the page as often as desired with minimal cost. Given that there are hundreds of disparate applications, putting time and effort in producing books may well be less appealing than licensing the discovery to a TPB. In this way, the IPB can concentrate on inventing and developing enhanced, related or different products.

Market pressure and the profit-motive means that inter-disciplinary rivalries and jealousies (so typical in academe) are pushed to the background. Any source of knowledge that has a claim to validity can be explored, incorporated and applied if it is believed that the resulting intellectual product will work. This is not a multi-disciplinary approach but rather meta- or trans-disciplinary approach. All inquiry efforts are governed by the drive to produce a workable profit-generating product in which the deeper sources of the knowledge disappear for the user.

Academics in the social sciences produce models which are disparate in nature but uniform in the fact that they do not work in practice. They are an output that adds value to a disciplinary career if they are fashionable, clever and plausible. Their value is evident

from the generation of disciplinary debate and inquiry. There is no requirement on an academic to produce tangible value in wider society, a factor which becomes a source of social irritation and even friction at times.

THE WORK TO BE DONE

In any attempt to organise and manage, the first task is absolute clarity about the work to be done. We never want to control people, but we do want to control work. In practice this means determining and allocating specific responsibilities for work. Common-sense suggests that people should be left as free as possible to discharge their responsibilities and get the required work done. The problem in practice is that there is widespread confusion about how to describe work.

> Jobs are often left without any description at all in businesses of all sorts. Most people looking at advertisements have to focus on the title and the salary as a realistic guide, because the work-requirement is non-descript and aligned to current fashion: e.g. leading, driving, innovating, team-player, communication skills etc.

It is essential to distinguish between the kind of work to be done and the level of responsibility for that work. The same kind of work, e.g. improving nursing care or generating software innovations, can be performed at different levels of sophistication. Much effort within the Technology of Common-Sense® has gone into producing precision and clarity about levels of work and responsibility required by conventional enterprises.[2] Once the levels of work-to-be-done are clear, a rational foundation in human fundamentals becomes available and from this it becomes possible to discover and develop principles of organisation and management that can have enduring practicality.[3]

Conventional Organisational Responsibilities

The essence of conventional work is that it is focused on tangible activities which produce a concrete result: selling a pound of sugar, manufacturing a pair of shoes, cooking a meal, building a brick wall, excising a cancer, auditing accounts. Money is made by doing the same thing over and over again to suit different customers or clients, perhaps with slight variations as methods develop and regulations or tastes change. Higher levels of management are required to deal with increasing scale and widening scope of such activities.

In large businesses of this sort, bureaucratic (i.e. procedural) control of activities is essential to control costs, to ensure quality, to conform to regulations. There are five levels of bureaucratic responsibility as follows:

BL1 **Action control:** Carrying out concrete tasks whose objectives and output are or can be fully specifiable beforehand to the smallest requested degree.

BL2 **Situational control:** Assessing and dealing with concrete open-ended situations in accord with professional training or in terms of given methods and systems.

---

2 See: Kinston, W. and Rowbottom, R. (1989) Levels of work: New applications to management in large organisations. *Journal of Applied Systems Analysis*, **16**: 19-33; Kinston, W. & Rowbottom, R. (1990) A new model of managing based on levels of work. *Journal of Applied Systems Analysis*, **17**: 89-113.

3 The SIGMA Centre Ltd is an IPB and products of this new technology related to levels of work include: Kinston, W. *Stronger Nursing Organisation* (1986); Kinston W. *Making General Management Work in the NHS* (1988). Other products are: Kinston, W. *Strengthening the Management Culture* (1994); Kinston, W. *Working with Values: Software of the Mind* (1995).

BL3 **Operational control:** Devising and installing socio-technical systems to handle a flow of concrete tasks which may be open-ended or prescribed.

BL4 **Management control:** Programming and budgeting for a range of operational systems or services or departments serving a given territory or market.

BL5 **Strategy control:** Shaping a totality of operations in a particular territory or market i.e. ensuring tasks and programs are instituted to meet strategic objectives for the enterprise.

Above this operational entity can be found two higher levels which perform headquarters work:

BL6 **Policy definition:** Providing policy and resource frameworks for a set of operational entities forming a conglomerate or covering multiple territories.

BL7 **Enterprise definition:** Defining basic parameters including the needs to be met, products or services to be provided and organisational arrangements to deliver them.

Organisations do not need to institutionalise all these levels—in the sense of having one or more posts for people to work full-time at that level. In small enterprises, either the higher levels of work are not done or the person in charges spends a minimal amount of time on them and only when compelled to do so. Tiny businesses at BL1 (e.g. window-cleaner) or BL2 (e.g. a corner shop) demand minimal attention to management issues. A business large enough to be set up at BL3 starts raising management problems. Complexity increases for BL4 businesses which need BL3 departments for each of production, marketing and development. Still larger and more complex BL5 businesses need BL4 divisions in these functions, as well as a range of supporting divisions like finance, personnel, and information technology. The natural urge is to organise a business to function at BL3, BL5 or BL7 (rather than BL4 and BL6) because these odd levels are associated with a sense of wholeness and completion.

Volumes could be written elaborating this sketchy outline, but the above must suffice for now.

Managing Academic Inquiry

Academic disciplines have a long history and the way they operate is reasonably well-established. Investigation of disciplinary work in practice, as well as theoretical implications of the framework of communication in The Technology of Common-Sense®, have again identified seven distinct levels of work. Now the preoccupation is with intellectual control, and so we can refer to “intellectual levels’’ rather than “bureaucratic levels”.

(Our concern here is not primarily with academic work. However, such work is not very different to the inquiring work of an IPB without the commercial constraints and imperatives.)

In defining academic work, the centrepiece is the stand-alone research project. A well-conducted piece of research or scholarship advances the discipline. To be funded to do such work, a scientist must be trained and reputable. He must deploy a system of concepts which envisages the project and its value, while also showing how this conception can be realised successfully. He must proceed in an organised way with the result analysed systematically so as to produce a sound and acceptable result. Once the project is

underway, he must be able to intervene and exert control at any stage over any aspect of the research process. This level of work is IL3, and it corresponds to what is expected of people with titles like “researcher” or “lecturer” or “assistant professor”.

The most basic level of work recognizable within the discipline, IL1, is that of a technician or research assistant. The technician must be able to perform standard research activities like library searches, laboratory tasks, computer programming or subject interviews—and do so intelligently. The person must not only be trained in specialised techniques, but must be fully educated in their logic and principles. As a result the individual can appreciate the purpose of the particular project and the conceptual links to his specialised contribution. Note that unlike BL1 work, the output is not fully specifiable beforehand (although its general nature and specific tasks are). Technicians are expected to use their judgement as to what constitutes technical control and satisfactory performance. Confidence in the quality of execution of research procedures gives higher level staff confidence in the project results.

Between the responsibility for the project as a whole and the specifics of the performance lies work which can best be described as project strategy or project supervision. The conceptualised project has to be conducted in the real world which means facing unpredictable changes in circumstances or practical obstacles and adapting to them without spoiling or invalidating the research objectives. Unexpected phenomena or findings in the course of the research process must also be appreciated and handled. Again, disciplinary concepts and principles are paramount in all choices. We can place this work in IL2 and label it the senior assistant or junior researcher level.

Projects make most sense when they are part of a programme of inquiry. Research funding bodies distinguish between projects, usually lasting 1-2 years at most, from programmes which are expected to last 5 years. Such a programme pushes forward knowledge coherently in a given area. Academics at this level, IL4, may be senior lecturers or professors.

There is no higher level of research, but there are higher levels in a discipline. It seems reasonable to call them higher because they bring research findings together and guide future research and funding. Furthermore, although anyone can work at these levels, only the contribution of the most senior academics are given value by the academic peer group.

At IL5, knowledge is articulated in state-of-the-art reviews of the literature, forwarded via meta-analyses, and stimulated via tentative worthwhile hypotheses suitable for sustained inquiry. At IL6, inquiring is kept under control through work which clarifies and articulates principles defining the discipline and which spells out challenges facing its membership.

The work at IL7 is around establishing and sustaining the discipline as a social entity. Basic parameters, the scope and boundaries of the discipline, need assertion and recognition. This depends on ensuring a supportive membership, thriving academic journals, symposia and conferences, institutionalisation within universities, and ongoing funding by statutory and voluntary bodies. It all takes work!

The Relation between Organisational Work and Academic Work

Similarities between organisational/bureaucratic and academic/intellectual levels of work are evident:

At L1, both carry out tasks as specified and exert control at the level of performance. Time scales are usually days or weeks, rarely months.

At L2, both involve assessments of complex situations as they evolve. Time scales here are no more than 3 to 12 months.

At L3, both require a whole system to be devised and implemented. Typical time scales are 1-2 years.

At L4, both call for programming and budgeting for a set of related systems to enable overall progress. Typical time scales are 2 – 5 years.

At L5, both impose shape and coherence on a wide range of ongoing processes. Time scales may extend to a decade.

At L6, both provide abstract guidance for thinking and activities.

At L7, both determine social parameters of identity and uniqueness.

However, the differences are just as important and these are apparent right from the most basic level of work:

If you quiz someone working at BL1 about what they doing, their answer will be brief: 'why, that's how you do it', or 'the boss told me' or 'that is what we were taught to do' or 'it is part of the business'. Links between activities will be offered but no understanding or conceptual appreciation. By contrast, if you quiz a technician at IL1, you will be able to elicit a detailed account of a theory or principles or a conceptual account and explanations of how their work fits into the project conception. The IL1 technician is capable of teaching (e.g. undergraduates) and actively learns so as to keep up to date.

Of course, professionals within businesses, often working at BL2 and BL3, can articulate theories intrinsic to their training, but the theories are in the background not to be tampered with or challenged, while activities flowing from them are in the foreground. Success or failure is determined by these activities and by their concrete outcomes, not by any confirmation, falsification or modification of the background theories.

To get any form of conceptual account in a conventional business which can be challenged conceptually and altered in the light of arguments or events, it is necessary to speak to someone at BL5 i.e. a chief executive. The output here, strategy, must be conceptually underpinned by linking to company policy or vision, or either it does not count as a strategy or the person is not doing the job.

The mental operations at BL6, which involve policy control and comprehensive resource analyses, have similarities to work at IL2 which also must manipulate concepts and resources in the light of ongoing activity. Because the identity work at BL7 involves handling a system of concepts, it is akin to work at IL3. Of course, running a multi-national enterprise demands far more responsibility than running a research project, because of the impacts on employees and on wider society. By contrast, the majority of academic research projects have a near-zero impact; and, even if published, they may never be cited.

We can therefore lay out the work to be done as follows in Table 1:[4]

---

[4] This table is extracted and modified from a larger framework of communication, identified and precisely located within the Technology of Common-Sense®. In the complete picture, there is one lower approach (i.e. with its 4 levels) and 3 higher approaches, making 7 in all. Each 7-level hierarchy defining a system of responsibility overlaps 2 approaches and so is made up of four levels of one approach and the lowest three of

TABLE 1:

COMMUNICATION APPROACH			ORGANISATION of ACTIVITIES	ACADEMIC DISCIPLINE
Institutions & universals dominate. **[Approach 4]**	CL-16			
	CL-15	Developing a coherent system based on universals.		IL7: Discipline establishment: unifying inquirers
	CL-14	Accumulating organising and assessing universals for use.		IL6: Inquiry definition: challenges & principles
	CL-13	Asserting and using universals as specified.		IL5: Knowledge articulation: synthesising understanding
Theories & concepts dominate. **[Approach 3]**	CL-12	Developing and relating multiple concept-based systems.		IL4: Programme design investigating an area
	CL-11	Developing a coherent system based on concepts.	BL7: Enterprise definition	IL3: Project conception: testing knowledge
	CL-10	Accumulating organising and assessing concepts for use.	BL6: Policy definition:	IL2: Project supervision shaping a study
	CL-9	Asserting and using concepts as specified.	BL5: Strategy control:	IL1: Technical performance performing techniques
Activities & information dominate. **[Approach 2]**	CL-8	Developing and relating multiple information-based systems.	BL4: Management control	
	CL-7	Developing a coherent system based on information.	BL3: Operational control	
	CL-6	Accumulating organising and assessing information for use.	BL2: Situational control:	
	CL-5	Asserting and using information as specified.	BL1: Prescribed output	

CL = Calibre level. BL = Bureaucratic level; IL = Intellectual level (or Inquiry level)

the approach above—see Table 1. There are seven such hierarchies with the seventh comprising all 4 levels of the highest approach and (as if in a circle) the bottom 3 levels of the lowest.

ORGANISING INTELLECTUAL WORK

Commercially Viable Intellectual Products

Let us now consider work within an IPB. It is intrinsically intellectual and inquiring or investigative in nature. Any physical activities performed are subsidiary to processes in the intellectual domain where the essential work takes place. In moving intellectual work out of the academic context, we do not alter its fundamental relation to communication systems, nor to capability and responsibility. So the formulae for the levels remain IL1 to IL7. But we do need to adjust the labelling.

In an IPB, the essential work demands the handling of concepts in order to produce an intellectual product that is commercially valid and valuable. Once again, it seems that work to define and produce such a product would be located at IL3 i.e. it involves developing a coherent system based on concepts. An example might be a rounded assessment of the viability of a company's business plan as input to a decision on the injection of venture capital. It is not sufficient to glance at some papers and say 'good management, growing market, strong cash-flow'—even if that is the way advice is communicated. What is required to justify such statements is a proper conceptual appreciation of the industry, the relevant market, management, balance sheets and cash-flows. As is typical of IL3 work, the correctness of any decision may take up to a year or two to become apparent, and any analysis generally becomes outdated over that time-period.

Someone working at IL3 will require assistance in obtaining information and conducting quantitative and qualitative analyses. This supporting work takes place at IL2 and IL1 where partial analyses and investigations may take place. (I exclude purely administrative and clerical support which is naturally located at BL2 and BL1.) For example, programming software complex enough to be called a project is most efficiently handled by having a 'meta-programmer 'at IL3. The work here involves developing clarity about what the software is for, its basic functionality, what it will look like, what the underlying structure is, any specific programming technologies to be used and so on. The actual software can be written by teams of programmers at IL2 and IL1, each tackling a particular module. Design decisions are referred back to the IL3 leader who has the task of evaluating progress and ensuring general coordination.

An idea for revolutionary piece of computer technology can be developed at IL6, but it would be taken on as an implementable challenge at IL5. The work here would involve determining discrete software production projects and essential alliances with other technology companies. To weave these into a strategy requires work at IL4. Then the software would be developed within IL3 projects, each with a number of modules staffed at IL2 and IL1.

Intellectual work as a primary output is also found at these lower levels. Independent financial advisers, for example, appear to work at IL1. They assert concepts and apply them as instructed by their (uninformed) clients. As well as advising on investments, they can teach the basics of investing to their clients. They naturally tend to interact with clients only when there is something to sell them.

Informed and wealthier clients require financial advice at a minimum at IL2. That is to say, they require an input with more thinking about their portfolio: in short, an investment strategy. They want their portfolio tailored to this strategy as new opportunities emerge, markets evolve and their financial position develops.

Both IL1 and IL2 advisors are likely to subscribe to investment newsletters (each one is a product) from companies which assess markets and opportunities and give precise advice and forecasts. Such firms, perhaps only a few people, should have a rigorous conceptual basis and be set up at IL3 as a minimum. If, however, they are simply information providers and do little more than pass on conventional wisdom (e.g. 'lower interest rates are good for equities'), then they are probably functioning at BL5 (or IL1).

Larger advisory groups offer a range of products tailored to different markets and institutions. In such organisations, it is possible to envisage work at IL4. Such work is more abstract and general, of course, and implies determining and organising a stream of new intellectual products in a particular area (say, price forecasting or fund management), designed so as to dominate and develop a bridgehead for the firm in their market. Work at IL5 would be responsible for shaping the evolution of the firm's technology so as to maintain market leadership. It starts with ideas which are, in principle viable and seeks to convert these into viable products or outputs through organising outputs from IL4 and IL3 staff: e.g. there may be a number of IL4 divisions focused on product streams adapted to market sectors.

Work at IL6 sets the general direction of research by recognizing upcoming competitive challenges in relation to the technology and clarifying technology policies and principles to guide the firm. Work at IL7 involves defining the technological domain to be covered by the business, its scope and boundaries, its methods and linkages.

With this summary, we can now re-do Table 1 with new labels:

TABLE 2:

COMMUNICATION APPROACH			ENTEPRISE BUREAUCRACY	INTELLECTUAL PRODUCT BUSINESS
Institutions & universals dominate. **[Approach 4]**	CL-16			
	CL-15	Developing a coherent system based on universals.		IL7: Domain definition: scope and methods
	CL-14	Accumulating organising and assessing universals for use.		IL6: Technology policy: challenges & principles
	CL-13	Asserting and using universals as specified.		IL5: Technological leadership: shaping overall progress
Theories & concepts dominate. **[Approach 3]**	CL-12	Developing and relating multiple concept-based systems.		IL4: Products strategy capturing a market sector
	CL-11	Developing a coherent system based on concepts.	BL7: Enterprise definition	IL3: Product conception: the money-maker
	CL-10	Accumulating organising and assessing concepts for use.	BL6: Policy definition:	IL2: Product realisation: adapting to circumstances
	CL-9	Asserting and using concepts as specified.	BL5: Strategy control:	IL1: Product implementation: technical execution
Activities & information dominate. **[Approach 2]**	CL-8	Developing and relating multiple information-based systems.	BL4: Management control	
	CL-7	Developing a coherent system based on information.	BL3: Operational control:	
	CL-6	Accumulating organising and assessing information for use.	BL2: Situational control:	
	CL-5	Asserting and using information as specified.	BL1: Prescribed output	

CL = Calibre level. BL = Bureaucratic level; IL = Intellectual level (or Inquiry level)

Recognizing the Bureaucratic Element

Because an IPB is driven by the urge to create intellectual products valued in the market-place, it can remain rather small. Most BL3 businesses employ at least 10 people. But an IL3 business can operate as a husband-and-wife team. Innovative software, for example, can be placed on the Internet or made available as shareware and the infrastructure to respond to queries, produce upgrades and so on can be automated so as to make minimal demands. Similarly, a financial product based on an option-strategy can be developed and operated by a trader with an assistant supporting execution. If growth is desired, only one or two more staff at most are needed to develop contracts with large banks to do packaging and selling.

Highly specialised innovative consultancies based on intellectual inquiry may be staffed by 2-4 people and earn income by providing clients with an IL3 product. For example, space-use consultancy advises on the best use of rooms and buildings in the context of the work to be done. The principal in such outfits will both be the project deviser and manager, and also the person handling the strategic implementation of the consulting project as well (IL2). One or two assistants may be used to get information and organise or analyse it according to pre-defined or specific methods (IL1). Such an 'assistant' is not a secretary (BL1 or BL2), and because priority is given to ensuring and responding to a flow of projects requests, in the absence of a BL2 administrator, invoices often fail to be sent out, clerical tasks do not get done, expenses are not recouped and generally the office becomes chaotic and suffers.

Where the consultancy is less specialised, e.g. corporate advisory work, then efficiency pressures and the ease of staffing enables a business to be formed with multiple project managers. Such IPBs are instinctively conceptualised at IL5. In such businesses, there is a desire to do more than earn a living. The business expects to generate a stream of products or carry out a stream of projects, each of which is intrinsically valuable. In a biotech firm, these products are new tests, drug targets, or new drugs. The business aims to make money by selling or licensing their discoveries at an early stage and by gaining royalties from sales once the drug enters everyday use. In a software firm, the products are new software applications. In a financial firm, the products are new forms of investment, or new ways of reducing risk, or new ways of exploiting capital flows.

When the firms ambitions are large, then it requires more staff. Not only are there many more people involved in the product creation, but a marketing division is also required. The more people, the more bureaucratic issues: recruitment and employee issues; payroll, budgets, accounts and taxes; legal compliance and insurance; buildings and facilities; computerisation and office equipment.

In some IPBs there are also issues of customer support and servicing. Financial technology firms like hedge funds need to handle enquiries, especially when profits fail to materialize. Creatives and rocket-science-software engineers are reluctant to put too much time into soothing egos or answering the same questions dozens of times. So far as possible, many matters may be contracted out. IPBs can use specialised back-office companies; specialised catering and facilities management companies; specialised payroll management, and so on. Nevertheless, the contracts with these external bodies must be managed and monitored to get value for money.

So, side by side with a technological leadership, there is a growing need for executive leadership. The chief executive who believes he can be both is self-deluded. The mental outlook and language approach of someone who enjoys mastering activity-based matters intrinsic to a supporting infrastructure is utterly distinct from the mental outlook and language approach of someone who enjoys mastering intellectual challenges associated with a new technology.

In a biotech company, there needs to be a Chief Scientific Officer who is leading the science and a Chief Executive Officer who can ensure a steady flow of finance based on equity, debt, grants, licenses and so on, as well as having the skills to negotiate good deals on discoveries. In a software company, there needs to be a Chief Technology Officer who is leading pioneering efforts in coding, and also a Chief Executive Officer who is ensuring marketing, staffing, and other infra-structure requirements are being handled.

Success is most likely if the intellectual technology supremo appreciates financial, managerial and industry imperatives and if the organisational chief executive appreciates the intellectual product and the technicalities of pursuing the intellectual process.

> Conventional CEOs are intensely power-oriented. Domination does not invent, create or discover. But it can make money, defeat competitors and bring people into line. With IPBs, if the peons are slaving at BL1, and marketers are hyping the product to the punters, a clever ambitious CEO can do well. With IPBs a power-centred CEO can be death. Scully specialised as a corporate in-fighter at Pepsi before contributing to the destruction of Apple. Manzi, a marketer who came to lead Lotus, boasted of his technical ignorance and was incapable of relating well. He made enemies inside and out and disrupted creative activity.

How Things Go Wrong.

Because of the similarities and in the absence of penetration to the fundamentals of work, there is all too often a lack of understanding by management of the intellectual and technical processes.

The primary error seems to be to fail to recognise the differences between workers focused on activities/information and those focused on concepts/theories. For example, salesmen of large insurance and pension firms often work at BL2. They are trained up as if selling was an activity and so they lack concern for conceptual issues. They also neglect the time dimension. Within days or a few weeks at most, the most uninformed person can detect that the second hand car foisted on them by a slick salesman is falling to pieces. By contrast, it takes years to identify a dodgy pension product or a phony 'guaranteed' savings vehicle which may be pushed by prestigious names in the funds management business. Large UK companies like Prudential and Equitable Life willingly allowed mis-selling. As one former Managing Director of a leading investment bank said to me: 'you can only sell financial products to the public at the wrong time'.

CALIBRE AND CAREER PROGRESSION

What does 'Higher Level' mean?

Hierarchy disturbs people. But it exists in work life. Career progression is the movement of individuals up a hierarchy and into roles carrying progressively greater responsibility.

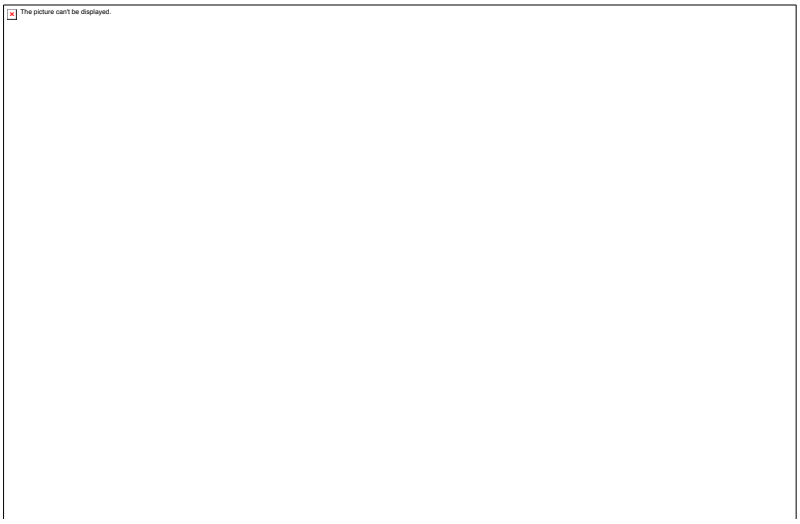
'Higher level' in this framework means greater complexity to be mastered. In the social world, complexity is handled through more sophisticated modes of communication. As levels are ascended, communication becomes more abstract and intangible. Information is more abstract than action, concepts are more abstract than information, universals are more abstract than concepts, and so on. Mastery of abstraction is recognized in the social world as capability. Even within the broad categories, each level shows an increased scale and scope of work and a concomitant discrete step in capability.

Such an analysis has profound implications for recruitment and career progression. Note that it runs counter to conventional approaches to assessing capability based on things like skills, knowledge, competencies. Instead it taps into the essence of achievement: the production of results in the social world and the mental processes and discretionary judgements underpinning this.

In accord with these views (and so counter to conventional beliefs), major career moves are determined by the individual's own sense of growing capability, his actual track record

of achievement, and the recognition by superiors of potential abilities that deserve an opportunity to be realized.

The greater the potential, the faster the rise through the levels i.e. the capable person attracts greater responsibilities at a younger age. Responsibility may grow in association with an intra-level move i.e. via a higher grading and pay; but shifts in outlook which equate to major life changes are defined by a move from one level to the next.



AUTHORITY RELATIONS

Levels of work in bureaucratic organisations have an important property: they determine the optimum distance for exerting line-managerial authority. A line manager is expected to be able to assign duties and tasks, appraise subordinates ability and performance, and foster their development. Unless the manager is working one level above the subordinate, he will be regularly challenged by the subordinate on the one hand, and on the other will be powerless to respond constructively to work problems faced by the subordinate. If the manager-subordinate distance is two levels (of more) then the distance is too great and the superior will experience himself being dragged down to fill the gap. A common observation is that subordinates have a great deal of difficulty appreciating what people more than 2 levels above them actually do when they are working.

It was discovered at an early stage of these researches that line-management ceased above BL5. At the higher headquarter levels, group work and collegiality are the norm. The theoretical explanation of this empirical finding is simple. It is possible to observe and instruct in the realm of activities and information (BL1 – BL4), but conceptual work dealing with ideas and values exists in the mind and so direct control and instruction is impossible. People cannot easily change what they think (as opposed to what they do), and a continuous flow of instructions inhibits or even prevents performance of higher level work, i.e. work at BL5/IL1 or above.

It is also worth noting that performing activities without commitment is rather easy, whereas thinking intelligently without commitment is not.

The implication for IPBs is clear. The conventional managerial hierarchy is not appropriate. Hierarchy itself remains: it is a phenomenon generated by the need to discriminate work and organise people, but the exertion of authority is another matter. Hierarchic authority principles require complementing by **polyarchic principles**.

In a conventional business, policy and strategy must come from the top because the market, operations and social environment cannot be observed and analysed from anywhere else. This may not hold for IPBs. Certainly, in academia, freedom of thought encourages junior staff to develop views of their discipline and its knowledge base. In business, if the result is to see things very differently, then such freedom leads to the possibility of leaving and starting a new and perhaps competing IPB.

Polyarchic Work Relations

The essence of polyarchic principles is that they assume that participants in the enterprise are willing and actively desirous of the business's objectives. Because of the intrinsic personal commitment required for intellectual work and the excitement and pleasure in discovery and invention, this assumption is reasonable. If in addition, as is common and desirable, the participants have an equity participation in the business, then positivity is that much more bolstered and enhanced.

An IPB values knowledge over habit, cherishes rational inquiry, encourages free communications, celebrates commercial relevance, champions independence of mind and becomes in consequence one of the formative institutions of the present era. Conventional managerial control inhibits such a culture.

Authority then flows from the logic of the individual's activity and the close identification of the individual with the enterprise, instead of being dependent on a particular position or on temporary assignation of powers by a higher-level manager. Authority may need to be assumed regarding:

- initiating activity,
- ensuring exchange of information and knowledge,
- linking discrete groups,
- neutralising boundaries,
- resolving conflicts,
- collaborating on pieces of work,
- ensuring joint control,
- allocating roles in projects.

For example, staff may ascribe to themselves a challenge or project which they perceive is needed. Alternatively, they may elect one from among them to take on a task or to coordinate new activities. At the extreme, a syndicate may be constructed and funded clandestinely from other budgets so a group can work together. Staff may carry out self-defined investigations, collating and analysing information collected from others in the IPB. Or may disseminate information, provide feedback spontaneously or stimulate independent proposals. Sometimes mutual tutoring develops in which staff educate each other.

Linkages that might take a long-time to negotiate can occur spontaneously in polyarchies. A staff member may simply start attending groups outside his usual remit, sometimes taking on important roles within them, or acting as a linchpin to his original group. One person may sponsor or adopt another in relation to an issue or project; or if there is a dispute act as a confidential representative. Divisional or even company boundaries may be disrupted by bringing in new values or by linking with external groups because they

share similar interests or objectives. A high level of advocacy, dissociation or criticism may emerge.

Hierarchic Work Relations

Hierarchical control is required to ensure that certain procedures are adhered to, to ensure that certain systems are developed and followed, to ensure that expenditure is monitored and controlled and, above all, to ensure compliance with the law. The typical relationship is main line-managerial in which the manager is one level of work above the subordinate and is expected to set general responsibilities, specific tasks, and immediate priorities. To manage someone effectively, the manager must be able to appraise the competency and capabilities and, if need be, arrange for training.

Matching the Person and the Task

If there is a mis-match between the demands of an assigned task and the person expected to perform it, then there is disruption. If the task is too easy, then the person becomes progressively dissatisfied and will either leave, spontaneously take on more difficult challenges, or be generally disruptive and critical. If the task is too difficult, then the person fails. This failure may be hidden or avoided, for example, by postponement, delegation, requests for more funds or more staff. Continued pressure for performance leads eventually to illness or escape. Often the superior will handle the situation by reducing the work demands and performing the work themselves. In a bureaucratic enterprise this is disastrous because the lower level work is always time-consuming and much of the higher level work, for which the superior is being employed, gets left undone.

Although many aspects of work can be handled by training and experience, the capacity to carry responsibility for complexity is not trainable. It develops over time at a rate intrinsic to the person. As a result assessment of personal potential is critical in all organisations. Fortunately, individuals themselves have a good sense of what they can and cannot do when it comes to levels of responsibility.

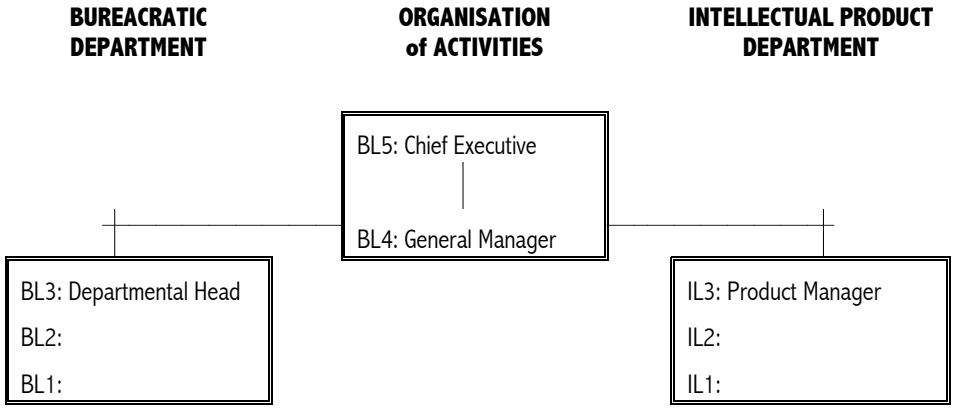
The Dilbert Phenomenon

Polyarchy and hierarchy come into conflict when discovery work abuts on infrastructure requirements. Budgets for example need to be set, monitored and met via conventional hierarchy. Permission to adjust (vire) budgets is also required. In any bureaucracy, the pointy-haired manager in the Dilbert cartoons sits at BL4, responsible for budgets and work programs to meet targets set from above. BL4 is the lowest level of general management and the highest level of concern for activities (see Table 2). Much of the humour revolves around the pointy-haired manager being unable to grasp what his subordinates are doing. This situation comes from imagining that bureaucratic levels (BLs) and inquiring levels (ILs) are parallel, so that someone at IL3 can be line-managed by someone at BL4 in the same way that someone at BL3 can (see Table 3).

The psychic reality is that a BL3 product manager is indeed working at a level below the BL4 manager, but the IL3 product manager has been made a subordinate to someone who is 3 levels of work *below* him. Put the other way, the BL4 manager is trying to instruct and control someone who is functioning *3 levels above* him. Based on our findings shown in Table 1, the BL4 manager will be clueless. That means he will be unable to understand the difficulties being faced, unable to set realistic time-targets, unable to appreciate costs or

consequences, and unable to help solve problems or even explain them properly to his own boss. In the absence of understanding, the general manager will seek to cope using defensively bureaucratic and arbitrary power-centred manoeuvres. The specialist IL3 manager ends up frustrated by the negative attitude and lack of understanding of his work, so communication and relations deteriorate.

Table 3:



It is evident that a large complex IPB requires two separate chains of command. One to control the technology and the other to control the mechanics. The chief executives at L5-L7 must have the capacity to handle plant, equipment, personnel, accounts etc and have some basic understanding of the product. Those on the technology side must have some basic appreciation of commercial realities, of the need for some order and system regarding finances and records, and of practicalities.

It is possible to place the two hierarchies side by side (see Table 4), only if it is understood that this *does not reflect equivalence in level of work* or *equivalence in communicative capacities*. Rather it reflects equivalence in *kind* of work and *type* of outlook. In both cases, L3, L5 and L7 reflect logical wholes whose coherence and consistency must be respected if the enterprise is to flourish. The even levels, L4 and L6, represent places where matters can go seriously wrong, hence change must always be considered, evaluated and controlled across three levels: L7-L6-L5, L6-L5-L4, and L5-L4-L3.

A degree of combination is possible, but only if handled judiciously. For example, anyone from IL1 upwards can perform BL1 work (e.g. telephone answering, filing, typing) but this may or may not be a good use of time. Whereas it is possible for IL4 staff also to carry work performed by someone at BL4, the reverse is not possible. Someone handling strategy for a project or product may also be able to supervise (BL2) various BL1 activities—but the reverse would be completely out of the question. Departments like accounting and maintenance represent specialised activities and so IL3 staff will perform these reluctantly and, for the most part, poorly. The implementer of new ideas for an IPB (IL5) is unlikely to make a good Chief Executive (BL5) because such work is too mundane and distracting. The Technology Policy Analyst (IL6) and the Commercial Policy Analyst (BL6) are immersed in entirely different worlds: they must be able to communicate easily but they cannot substitute for each other. Finally, it seems as if it might be possible to fuse the roles of Commercial Supremo (BL7) and Technology Supremo (IL7). In any case, the Commercial Supremo is the more important. Such a

person can work with concepts and, given good IL6 support and appropriate lower level structures, ought to be able to lead an IPB intelligently in the market-place.

Table 4:

ORGANIZING ACTIVITIES COMMERCIALLY	DEVELOPING INTELLECTUAL PRODUCTS
BL7 **Commercial Supremo**	IL7 **Technology Supremo**
BL6 Commercial Policy	IL6 Technology Analyst
BL5 **Chief Executive**	IL5 **Technology Shaper**
BL4 General Manager	IL4 Technology Strategist
BL3 **Department Head**	IL3 **Product/Project Head**
BL2 Supervisor	IL2 Process Supervisor
BL1 Clerical worker	IL1 Professional Technician

MARKETING

The IPB invites a strongly product-centric approach to marketing. For those involved, the new product is superb, unique, incredible. It revolutionizes the way the world works, enables undreamed of operational efficiencies and economies, provides a strategic competitive advantage.

As a result, the primary marketing approach focuses on development and enhancement of the technological capabilities of the firm which alone, it is correctly perceived, can lead to a stream of new intellectual products.

Marketing is alien to the inquiring imagination. The market is a creature of fashion, of conformity, of whim. It cannot even be defined unambiguously: it comprises a mixture of potential and existing customers, potential and existing companies with their existing and potential business strategies, governmental bodies subject to political pressures and regulatory agencies with their own agendas. Market realities cannot be grasped the way that technological realities can be. Market states exist in the minds of people as much as in current practices. Unlike empirical discoveries which stay put and inventions which keep working, the market is a dynamic evolutionary system whose future state is not wholly predictable.

Nevertheless, if an IPB is to succeed it must be part of a market.

If the intellectual product is truly new there will be no market for it. The emergence of such an intellectual product generates a market potential and it is that potential which must be explored and developed. So **market creation** rather than marketing is the task. Until a market is created, there are no receptive ears, and there can be no general recognition of value.

A technology adoption life-cycle has been identified. In the earliest phases, the product is only of interest to enthusiasts. It barely needs to function to get them involved and they see themselves as participating in its development. At the next stage visionaries who lead conventional businesses see the opportunity for a dramatic strategic advantage over competitors. They are prepared to work with the IPB to exploit the discovery or invention and may even wish to take-over the IPB. Work with visionaries does not generate the widest market and a take-over often sounds the death-knell for further intellectual products because the focus shifts to commercialisation. The founders may leave to start up a new IPB.

Markets are communal by nature. Profit comes in the third phase from a general acceptance and adoption of the new intellectual product. Only then can one say that a new product category has emerged in the marketplace. This is essentially the creation of a new market, and many things must align or fall into place before this can occur. Chief executives of conventional businesses are suspicious of the new and are reluctant to be guinea-pigs. Furthermore, they require anything new to be easily integrated within their existing plans and operations.

FIGURE 1:

……the text ends here…..