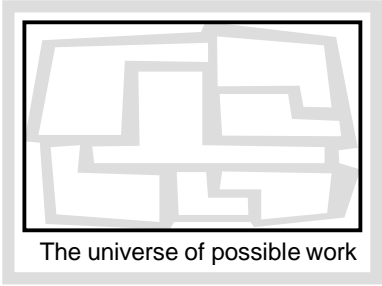# ActiPraxis Classification of Work

By Doug Johnson / doug_johnson@djhome.net / Version 7.7 / Aug 10, 2006

The universe of possible work

How do you describe the work you do? Manual ← → Intellectual? People ← → Objects? Easy ← → Hard? These answers might be good enough for a social setting. They don't suffice in a business setting.   There must be some better classification paradigm metaphorically represented by the diagram to the left.

When faced with the question of having to classify work, many practitioners resort to '*function*' such as: marketing, development, finance, human resources, legal, operations, sales, or management.   Others might suggest the '*industry*' in which they work: chemicals, automotive, travel, financial, government, health care, technology, and agricultural.   Still, others choose '*professions*' including: doctor, lawyer, accountant, teacher, nurse, plumber, pilot, engineer. Representative diagrams appear to the right. These are all fine descriptions and when taken together they provide a pretty complete picture of someone's employment – for instance: advertising-sales-professional or automotive-manufacturing-engineer. Classification problem solved?

Segmenting work by *function*

Not quite. Industry-Function-Profession combinations still have very wide variation in day-to-day *activity*. We would still have to ask "what are your activities in a typical day". Representative answers from an advertising-sales-professional might include:

- Work the telephones trying to get yellow pages customers to buy larger placements.
- Attend to every whim of our top fortune 50 customers keeping them pleased.
- Seek to discover the type of customer most likely to advertise on our new web based business.

The automotive-manufacturing-engineer might answer:

- Assist a supplier in improving their defect level of incoming parts from 10 per million to 5 per million.
- Design a new manufacturing system for a hydrogen engine.
- Tune a robot welder for 5% additional throughput.

If we asked a similar question of a nurse we might hear:

- Stabilize trauma patients just entering the hospital – frequently saving their lives.
- Helping an unfortunate resident deal with the discomfort of a chronic illness.
- Being efficient with operating procedures so that things stay on schedule.

Segmenting work by *industry*

Since the preceding examples all have some fundamental differences, – shown in the diagram by 'A' and 'B'-- perhaps something more is needed to further describe types of work in a way ambiguity is reduced and better matches between worker and activity ultimately result.

Jobs A & B while from the same function can be very different
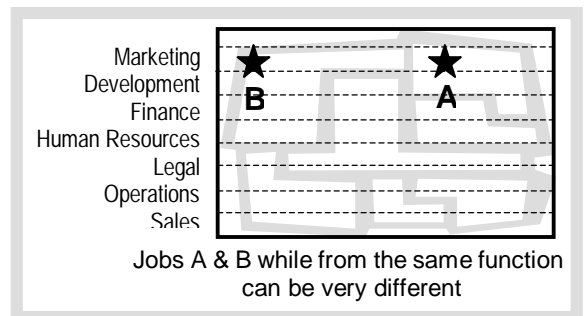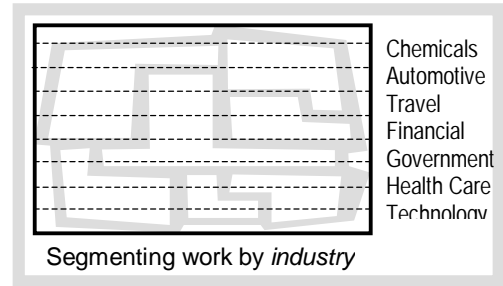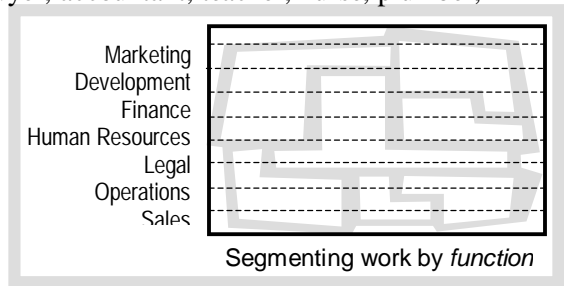
This paper proposes an additional classification variable for work activity based primarily around the presence or absence of predefined activity rules. The goal is to find a single model that is broad enough to differentiate between the widely disparate types of activity from the previous example that an advertising-sales-professional, an automotive-

manufacturing-engineer, and a nurse might each undertake. The result is a simple taxonomy Linnaean in nature [Linnaean taxonomy looks at just the essential nature of groups and is often criticized for subjective judgment in defining those essential characteristics] and non exhaustive in scope [an Exhaustive taxonomy would cover every possible situation]. Just six descriptors are assigned to cover all the activity types: Inspirational, Discovery, Prescriptive, Productive, Assistive, and Encouragement. Since individual workers each have a set of natural working style preferences to which they habitually gravitate – a fundamental well captured by the Greek word 'praxis' – it logically follows each individual is more or less suited for one or two of these types of activity. When properly applied, this concept, which we call *ActiPraxis*, has wide ranging implications for the effectiveness of employees. We call the six work types the ActiPraxis work activities. The ActiPraxis work types can also be mapped to the lifecycle of a project, program, or business, resulting in *CycloPraxis* [Johnson 2003 ,5 ,6] – an extraordinarily powerful staffing and managing concept.

OVERVIEW OF PRIOR TYPE-OF-WORK STUDIES

Surprisingly there have been only a dozen or so attempts to conceptualize and classify the variables associated with the kinds of work activities that people perform. None of the methods have become standards. Most either focus on too narrow a universe of activities or fail to reproduce accurate results when exported from their author into the hands of additional practitioners or scholars. The more popular methods are summarized in Appendix A of this paper. Each of the dozen or so attempts has in their own way attracted several dozen discussion papers published in scholarly journals. If the reader is interested, they may follow any of the bibliographies, or give special attention to Fleishman & Quaintance [1984] or The National Research Council. [1999]

The classification attempts divide the universe of work activity in a different manner than function or industry. Diagrammatically these alternate classifications could appear as a series of vertical divisions as in the figure to the right. This particular model has four major segmentation categories -- cognitive, psychomotor, physical, and sensory-perceptual – that are called abilities by the model's authors Fleishman and Reilly [1992]. Each broad ability segment has a number of sub segments yielding 52 abilities in total.

Segmenting work by *Worker-Attributes*

Cognitive
Psychomotor
Physical
Sensory-Perceptual

Previous classification attempts fall into three broad categories: *Ability, Behavioral,* and *Task*. Ability classifications [such as the present example] look at the skills necessary to do particular job. The primary function of an accounting position would list 'number fluency' as a necessary ability. A dental hygienist job would list 'manual dexterity' as a necessary ability in its primary function. Both jobs could have auditory attention as another required ability thereby enabling interaction with customers that might be a requisite element of the job.
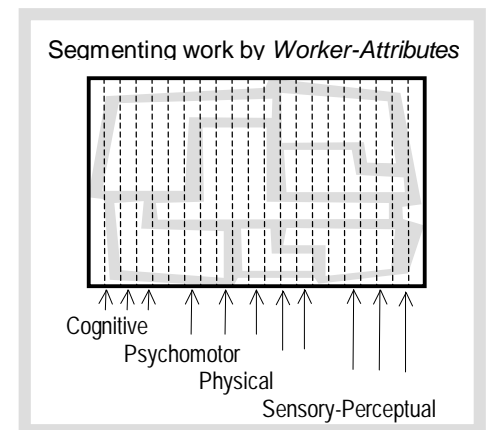
Task classifications are the most commonly chosen approach. High-level tasks are repeatedly divided into subtasks until the smallest unit of predefined rule based activity is identified. Task classifications are designed around a single industry or occupation; the activity of the military is a very common laboratory. Task classifications always have a variable that separates physical activity from mental activity. Physical activity might be further defined by attributes such as strength based, dexterity based, and endurance based. In situations where predefined rules do not exist to guide an activity, the task oriented classification approach cannot be applied. Such rule-less situations lead to the development of behavioral classifications.

Behavioral approaches to activity rely upon the human's ability to scan the environment, to use judgment, to solve problems, and to make decisions. Activity of this nature is not necessarily governed by predefined rules. R. B. Miller [as reported by Fleishman and Quaintance, (1984)] was a key researcher in the field of behavioral activity

classification. He uses an example of a soldier cleaning rust from his rifle. Of course, there are predefined-repetitive-rules that govern much of the activity. These rules are written in soldier's handbooks. But then there are behavioral activities – such as placing the opened bottle of rust remover on a flat surface so it doesn't tip over -- that do not have any predefined rules. Finding an appropriate place to put the open bottle relies on the soldier's basic ability to observe, judge, problem solve, and decide. Miller defined 25 behavioral variables: Message, Input Select, Filter, Queue to Channel, Detect, Search, Identify, etc. His work is intellectually stimulating but not widely followed. Colleagues who later tried to apply his behavioral classification failed to generate repeatable results. Apparently there are significant challenges in precisely interpreting and measuring the classification variables Miller selected.

In our experience most frameworks are accidentally self-limiting in that they narrowly explore chosen subsets without attempting to place those subsets in a larger context. Most all deal with activity governed by predefined-repetitive-rules. What about the other half of population whose work activity is not defined by rules? It is time for a more comprehensive framework.

THE PRINCIPLE ROLE OF RULES

Predefined-repetitive-rules form the basis of over half the global work activity thereby earning 'rules' the highest order actipraxis classification variable. Examples of rule based work are: - an accountant doing a client's taxes, - a union employee tightening lug nuts on an automotive assembly line, - a landscape service employee mowing commercial grounds, - a champion swimmer participating in a race, - a pilot flying a 737 from LAX to SFO. Synonyms the reader may have encountered for these predefined-repetitive-rules include *structure* and *formalization*.

Segmenting Work by *Actipraxis*
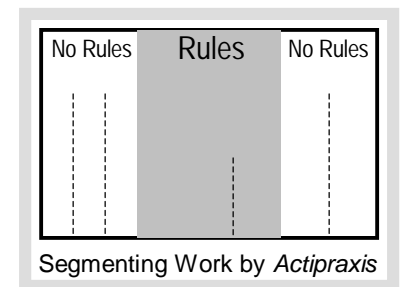
Predefined-repetitive-rules can follow a general syntax defined by *Activity Theory* [see appendix A]:
-   *Subjects* work on *Objects* according to Predefined-*Rules* with *Results* following from a series of *Actions*.
-   *Community, Goal*, and *Motive* are specifically defined.
-   *Actions* can be both mental and physical.
-   *Actions* are constituted of smaller units – individual operations – that can be conscious or unconscious.
-   Feedback is achieved through *Monitoring*.
-   Object-oriented activity is performed by a subject using tools on a material object.
-   Subject Oriented activity involves two or more subjects and is constituted through information exchange, personal interactions, and mutual understanding.

Predefined-repetitive-rules can be illuminating when they provide the workers with a way of viewing the tasks they are working on, or rules can be restrictive when they prevent the worker from searching for or considering alternatives rules. In some cases, the individual has free will to decide which rules to apply.

By definition, *rules* are *predefined*. Someone worked out appropriate actions prior to current execution. Generally rules are meant for *repetitive* execution as in tightening lug nuts, mowing lawns, and preparing taxes. [A few counter examples of single execution rules might exist in scenarios such as: a battle plan while fighting a war or a particular maneuver in outer space. In this case the rules are predefined, but not repetitive]. Repetitive rules are meant to be followed multiple times by one individual and/or one time by multiple individuals.

Rules are a formalization of the action expected to apply in specific situations. The work of a pilot makes for interesting study. Despite the perception that a pilot's work has great latitude and many freedoms, it is actually quite bound by predefined-repetitive-rules. The goal is to get from city A to city B. The community includes ground operations, air traffic controllers, flight crew, and passengers. Heavy reliance is placed upon alert monitoring of all the plane's feedback systems. 99% of the time, the object is the plane where the rules established by air traffic controllers and before that design engineers govern every permissible action. For instance, there is a rule – practiced again and

again on a simulator – for appropriate action should the starboard engine quit. Being a top pilot is simply a matter of being able to quickly recall and apply the correct rules.

By now, you may be asking, "are there not work situations for which rules are not followed? What then?" The answer is 'yes' there are plenty of situations. For example:
  - A divorce lawyer representing a client has to follow certain predefined rules [called laws] in each case yet has great latitude in addressing the individual requests of each family situation
  - In Christopher Columbus day, the restrictive predefined rule was not to sail west else one would sail off the edge of the world. Had Columbus not been inspired to work in a manner that disregarded the rules somebody else would have had to discover America?
  - The top producing construction site worker asks for and is granted a daily deviation from the routine start time rule in order to share in family childcare transportation. The supervisor's rationale is that positive motivation of this key employee is more important than 10 minutes of productivity.
  - The pioneers of the automobile faced situations where there were no rules. The rules were written as the industry unfolded. A key task of those early workers was to write the rules for later generations to follow.

Our analysis has identified five classifiable work activities for which rules are not defined: The first 3-- #2, #3, and #4 --in the list define a lifecycle for the development of rules. Rules do not define work activity in situations #5 and #6 due to a priority reason. For completeness a 7th reason surely exists when forces of nature take over.

  2. *Inspirational work*– conscious break from existing rules in order to make progress in some new direction – Columbus's discovery of America.
  3. *Discovery work*– rules do not yet exist beyond the established physical frontier – e.g. the automobile in 1900
  4. *Prescriptive work* – defining and demonstrating the rules to be followed for future repetitive productive work.
  5. *Assistive work* – conscious and permitted deviation from rules in order to satisfy unique requests of someone such as a client, customer, student, or patient, … -- e.g. the divorce lawyer.
  6. *Encouraging work* – conscious and permitted deviation from rules in the interest of optimum employee contribution – e.g. adjusting the start time rule.

In summary then, the actipraxis classification of types of work starts with the question of predefined rule based or not. If rule based, the work is productive. If not rule based, then the work is inspirational [break rules for new], discovery [learn rules], prescriptive [validate and encode rules], assistive [break rules to satisfy], or encouraging [break rules to motivate]. In the following sections, each work type is explored in more detail.

Simple rule anchored classification scheme for work activity
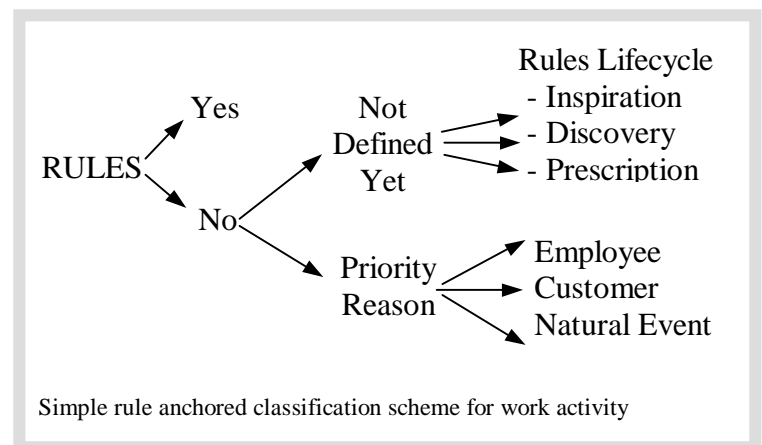
PRODUCTIVE WORK

Most everyone's fundamental image of work aligns with the formalized predefined repetitive rule-based work we call productive-actipraxis activity. Examples are varied and include assembly line workers, telephone operators, operating room nurses, drywall installers, roofers, retail cashiers, pilots, and accountants. Productive work most often delivers the output that is the basis for a business collecting revenue from its customers. Jim Collins [2002] in Good to Great describes the hedgehog principle as taking a simple concept and implementing it with fanatical consistency. Repeated customer appreciated productive work formalized by optimum rules is a surefire recipe for business success.

The universal measure of productive work is to achieve the most efficient use of resources. Efficiency might be measured objectively as cost per event, resources consumed, or time elapsed; effectively with quality or achievement; and/or subjectively by features, benefits, or fitness of purpose.   Repeating the same activity increases proficiency and improves efficiency.   Independent of the measurement[s], a nearly universal goal is steady improvement in chosen measures. Successive repetitions should show incremental gains.   All productive work follows the same overall lifecycle: -1) train participants on input, output, tools, rules, and community, -2) action -3) monitor -4) repeat.

Training workers – be they operators or professionals -- for their rule-based productive repetitive tasks is a key task in itself. First, the workers must be capable and willing. A variety of capability assessments have been previously identified. Capability is another matter and may require significant encouragement to get workers to abandon a rule based task at which they have become increasingly proficient for one at which they will be novices. Acquisition of the basic rules for the new task implies sufficiently advanced learning skills followed by compilation, comparison, and encoding of the new knowledge. Next, the worker in training must practice the new tasks that will require mental effort and focus. With sufficient practice, the processing becomes automatic and the skill is natural. At this point, the worker is ready for a formalizing assignment doing the new task. Note, during the training time, the worker is not engaged in productive work. Pre work would be a better descriptor – see below. Note also, the training and encouragement activities described in this paragraph are also most likely different actipraxis work types than the productive tasks activity the workers are being trained for.

In recent years, monitoring the progress of productive work has gained an important position in achieving overall operational efficiency. The Activity Theory of Rubinshtein and Leont'ev specifically studies the monitoring activity. At times monitoring is made a part of every productive-actipraxis worker set of rules. For instance, modern automotive assembly practice establishes peer quality teams at every workstation. Another example might be the construction-framing worker who after nailing every board grabs it to make sure it is tight. At other times, monitoring is a specialized function of selected productive-actipraxis workers. Incoming goods inspectors, beer brew-masters, and financial auditors are examples. Monitoring requires decision-making, which can only be controlled when the decision-making is bound by formalizing structure. In the 'everyone monitors' scenario, every worker is delegated the authority to select which of various subsequent rules a given situation warrants. In the 'dedicated monitor personnel' scenario, the judgment required is beyond the scope of the average worker thus requiring the selection and training of specialists. It is important to realize that these monitoring situations remain based on repeatedly following predefined rules.

Productive work was once equated with "blue-collar" jobs and tasks. Certainly in 1950 when blue-collar workers comprised over 40 percent of the workforce this might have been an accurate association. Today, two trends suggest otherwise 1) Blue-collar employment is well below 25 percent, and 2) Many white-collar jobs – especially those in the service industry – now have rule-defined tasks.   Today's job enrichment trends of increased breadth/scope/variability and increased decision making are not diminishing the importance or comprehensiveness of predefined rules and formalization. Only the job titles are changing; instead of roughly 100 different job titles for productive-actipraxis workers at a traditional auto plant, the Saturn Automotive plant has just one title for production workers and six titles for skilled trades.

In addition to the rule based underpinning of productive work, descriptors such as *structured*, *process-driven*, and *hierarchical* are often used. In these contexts, complexity, formalization, and centralization variables are identified. The changes introduced by information technology on productive work have been analyzed leading to the conclusion that greatest impact is felt on communication and coordination structures.   Activity Theory is perhaps the most fully developed analysis methodology for productive work. Other methodologies previewed in Appendix A – PAQ, FJAS, O*NET, OAI, CMQ, MOSAIC, and WPS -- also focus solely on productive-actipraxis activity.   Detailed activity inventory studies have been developed for police [444 individual documented tasks], lawyers, power plant operators, accountants, computer specialists, executives, oil field operators, and more. Much government bureau effort has been devoted to further classification of productive work.

At some point the pursuit of efficiency through improved rules and high repetitions will result in same activity being be automated or exported to a lower cost labor center. For instance, automated checkout machines are replacing cashiers and tax returns are being shipped to India for processing.   Similar risks face much of today's productive rule-based tasks. Other actipraxis work types gain attractiveness.

Absent from any prior discussions of productive work is any serious treatment of where the job rules come from in the first place. This question will be addressed in the 'Prescriptive Work' section below. Also absent from prior discussion is situations where rules may exist but are not followed. This question will be addressed in the 'Encouragement Work', 'Inspirational Work', and 'Assistive Work' sections below.

This section is concluded with a discussion of the grey area of productive work in the services profession. Services have grown dramatically -- from 30% of workforce to nearly 80% of the US workforce between 1900 and 2000. The 'Services Work' moniker embraces a variety of helpful, assisting, teaching, repairing, guarding, monitoring, construction, cleaning, and information retrieval tasks. While a slice of services work remains assistive [and will be explained in the next section], the general trend has been for services activity to become increasingly productive with accompanying rules and repetition. The trend toward productive work may be due to three driving factors. Specialization is the first trend; service providers increasingly focus on narrower core contribution. More professional services workers [lawyers, doctors, engineers, accountants] are banding together in firms than working solo. For instance, between 1931 and 1980 doctors working solo declined from 80% to 50%. Similarly, less than one third all lawyers in the US now work as private practitioners.   Working in a firm permits more repetitions of core competency activities and less time doing supportive work. Plus a profound migration from generalist to specialist in professional practices again results in more repetitions. Increasing repetitions inevitably drives formalization and productivity enhancing tools that are simply rules for effective completion of repetitive tasks. Examples might include word processing templates, Computer Aided Design methodologies, automated diagnostics, and established procedures. The second driving factor is technology itself. Years ago a serious abdominal pain may have involved an external exam followed by a good deal of judgment and maybe some exotic exploratory tests for further discovery – an interesting combination of productive, assistive, and discovery work styles. No longer. Today the patient is promptly put in the queue for a formalized CAT scan procedure. The same may be said about how computer office automation applications reduce business controls to a series of routine tasks. The third and final driving factor is competition. For instance, the customer needing a tax return completed has many options and is justified on settling for lowest cost. Economics will reward the most efficient provider. Initially at least, efficiency follows effective use of formalized productive work definition methods including defining tasks and establishing rule based approaches for each. Service professionals are once again encouraged to structure their work according to productive-actipraxis best practices.

ASSISTIVE WORK

At times a customer, client, patient, student or other *recipient* has a request of a *responder* in a *provid*er *organization* that falls outside the normal set of formalized repetitive-predefined-rules. The classic example widely studied is the telephone operator who by virtue of dial "0" or "411" gets asked all sorts of questions. Rules exist for query tasks such as "how much does it cost to call Mexico" or what is the phone number of the McDonalds on 5th and Main. However, the caller may just as easily ask "where is the nearest fast food restaurant, I'm at 3rd and Main". In this example, the recipient is the person placing the call and making the inquiry, the responder is the operator, and the provider organization is the local telephone company. Some other examples outside the predefined rule set of productive activity include:
  - The patient visiting a dentist who cannot wait the normal 2-week cycle time for a crown and needs a temporary solution that will last 3 months while they are overseas.
  - Booking a frequent traveler into their favorite hotel even when the computer says they are sold out
  - Visiting a customer for a 2nd training session on an instrument that has just a single session included in the purchase

- Temporarily swapping a problematic defective truck for a loaner truck in order to extend the time for diagnostics beyond an insufficient standard

In each of these cases – and dozens more just like them – a common pattern emerges. First, the recipient has an issue, a problem, a dissatisfaction, or sees an opportunity. Second, the standard response based on the predefined rule does not address the issue in a satisfying way. Third, the responder has been delegated the authority from their provider organization to deviate from the predefined rule – perhaps up to a limit – if such deviation will cure the recipient's issue. And finally, the recipient agrees to let the responder try the deviation ever hopeful that the issue will be mitigated.

The concept of a responder performing work for a recipient outside of formalized rules in order to address an issue and enhance satisfaction is a different type of activity than repetitive productive-actipraxis activity described in the previous section. This work is called *assistive*-actipraxis activity. Assistive-actipraxis activity is generally carried out through different workers who are delegated special authority. Consider for a moment the customer service personnel at a busy airport. Gate agents are required to follow classic productive work rules according to the norms of productive-actipraxis activity. Gate agents do not have the authority to deviate from those rules and book a misconnecting passenger on another airline. However if that same passenger were to find a customer service agent in a frequent flyer lounge or airline club to whom assistive-actipraxis work authority were delegated, the passenger might find their unconventional request granted. Assistive activity is the second most common actipraxis right behind productive activity.

The first condition and initial step for assistive work is recognizing that an existing rule is insufficient to provide a solution to the recipient's issue. Deviating from rules is not permitted in productive work, so right away another actipraxis work type is indicated.

The second condition and second step for assistive work is that the responder is delegated the authority by the provider organization to address the recipient's issue outside the predefined productive work rules. Many workers in productive work positions aspire to the greater freedom, reduced repetitiveness, greater personal rewards, and often-higher pay of assistive work. Organizations however reserve assistive work for their most trustworthy workers with best judgment and best recipient facing skills of politeness, helpfulness, and ability to personalize.   Furthermore since assistive work is produced and consumed simultaneously, there is little or no opportunity for post-production quality control.

The third condition for assistive work and a step that is sometimes overt/sometimes covert is that the responder gets approval for the solution form the recipient. Approval shifts the responsibility for an outside-the-rules-action to the recipient and away from the responder and the provider organization thereby assuring the provider organization's and responder's liability for the issue cannot become any greater.   For example consider the homeowner who has a stain in their carpet that doesn't come clean with the normal rule based cleaning methods. They ask the rug-cleaning vendor: "don't you have anything stronger?" The rug-cleaning vendor says, "Yes, but it's not safe for use on your carpet. The color may fade. Do you want me to try anyway?" If the homeowner says yes and the color fades, the rug cleaning vendor is not responsible. In a sense, the recipient is a "co-producer" and a critical participant in defining the assistive work content, both because of variation in customer characteristics and demands and because the customer introduces uncertainty into the assistive work production process.

The final condition for assistive work is that the desired positive end state for the recipient [aka customer satisfaction] is more important than the productivity associated by strictly following the predefined rules. If this is not the case, assistive work will not occur. Examples can be found in the customer service practices of monopolies, utilities, and government organizations. A request for deviation from the rules of the IRS is almost certain to yield a 'no' for reply. Or try paying a utility bill with an endorsement of a 3rd party check. These provider organizations do not value positive end states of their customer recipients.

Once all conditions are met, assistive-actipraxis activity solves the problem – the recipient's issue – by means of the application of problem solving techniques. Employees engaged in assistive work must therefore be good problem

solvers. Creativity and willingness to experiment are useful skills. Assistive work is intangible, heterogeneous [no two engagements are alike] and perishable [it cannot be inventoried], making performance measurement systems more difficult to develop and implement. Measures applied to the delivery of assistive work include: friendliness, reliability, responsiveness, and courteousness. Measurement responsibility is generally delegated along with the responsibility for independence of assessment and action, thereby further reinforcing the need for special selection of employees. Measuring success at the recipient is more important, but also more difficult. Sometimes the measure is immediate as in the exceptional tip for a waiter/waitress who deftly handled a diner's special request. More often the measure is abstract such as the long-term retention of a customer.

Productive-actipraxis activity and assistive-actipraxis activity are sometimes combined in a single position staffed by a single individual [detailed studies have been performed of airline stewardess's, fast food counter personnel, and call center personnel]. When a combination of productive and assistive work is assigned to a single individual the work does blend [as in mixing white and black yields grey]. Instead a time domain mixture occurs [similar to the spatial mixture of salt and pepper]. More often than not, the result from a mixture of styles is reduced performance on both productivity metrics and recipient satisfaction metrics. Productivity suffers because an issue handled with assistive work patterns will take two, three, or more times as long than if handled according to the more efficient rules of productive work. Employees who are more motivated by the efficiency improvement metrics of productive work will tend to become annoyed with assistive work as it detracts from their otherwise steady growth. Just think of the fast food clerk who growls at a special request. Conversely, employees who are motivated to assistive work by the rewards of seeing a satisfied customer can become disenchanted by the reduced satisfaction inherent in applying the rules of productive work to individualized situations. Just think of the fast food clerk who looks totally uninspired by the repetition of routine orders.

PRESCRIPTIVE WORK

Where do the rules for productive work come from? They must be established or prescribed. The activity to prescribe those rules is *prescriptive-actipraxis* activity. For example, someone has to come up with the rule for a productive-actipraxis airline pilot to follow in the event of a landing gear failure. That someone was probably a team of aeronautical engineers, safety specialists, and simulator programmers. Due to their expertise, they no doubt know the best procedure. A prescriptive activity of *encoding* turns the knowledge of these specialists into a predefined activity rule that others can repeatedly follow. The encoded result may be recorded in the pilot's handbook or loaded into a simulator as a routine to be practiced. Other examples of encoding might include highway specifications for the road building crew, repair manuals for an automobile, and computer prompts for a fast food outlet sales person.

Prescriptive-actipraxis activity also includes a *validating* activity that occurs alongside the encoding activity. Consider the repair manual mentioned just above. For instance, in order for the person doing the encoding work to be certain of the symptom-failure-fix relationship that person may take a new correctly functioning car and systematically introduce failures and observe the symptoms. Without validating the predefined repair rules to be encoded, subsequent productive work could be wasted and inefficient. Validating can take many different forms and is most conveniently viewed from a classically functional perspective.
- Development: Constructing proof of concept as in models, prototypes, or exploratory engagements. Proof-of-concept is first of kind wherein the tasks by definition cannot be predefined.
- Marketing: Customer reaction tests for price, packaging, advertising, features, billing. These validations are often called test marketing, prescreening, trials, beta, or shakedown. These are first time ever introductions of customers to new products/services where it is impossible to pre-define the reactions.
- Manufacturing: New product/process/equipment introductions frequently require tweaks and adjustments to find a recipe satisfactory for volume. In many cases, manufacturing engineers disassemble finished prototypes and conduct careful time motion studies in order to develop optimum assembly methods. Manufacturing validating work may also include suppliers, test departments, shop floor scheduling, purchasing, and distribution.

- <u>Operations</u>: A new medical procedure, a new client in a call center, a new recipe in a restaurant, or a new ski lift at a resort all introduce situations that have never been dealt with before. Ultimately a set of predefined tasks will be encoded that will guide subsequent productive work. As those tasks are being encoded, they will be validated through a series of evaluations.
- <u>Sales</u>: A novel sales concept or a new product/service can be validated in a small way before extending globally. Customer value statements are especially useful to test, refine, and encode in this manner.

Validating is an important component of the prescriptive-actipraxis activity and goes beyond the traditional functions of a business unit. Teachers validate the approach they will use to convey a new concept when they try out the approach on a colleague, friend, or unsuspecting student. A sprinkler irrigation company would certainly validate a new sprinkler head design before encoding a new set of design rules and distributing to the installation crews.

Finally, prescriptive-actipraxis activity involves some level of decision-making. The responsible *prescriber* has to *decide* upon content to validate and content to encode. In order to take a decision, the prescriber must feel empowered, be willing to accept some level of risk for the correctness of the content, and accept responsibility for the results of those who later follow the rules in productive-actipraxis fashion.

Measuring and monitoring during prescriptive-actipraxis activity looks at *suitability* of two types. First, are the results from a validating activity suitable for defining the productive work to follow? In other words, will a value producing enterprise result from the adoption of whatever is validated. For example, if a validation suggests that a new product will not reach its design goals for manufacture times, it will be judged unsuitable; and the conclusion may be to send it back to design. Second, is the encoding into predefined activity rules for others to repeatedly follow done in a suitable way for the audience? Consider the casual chatter you have while ordering at Starbucks. Most would consider this just a friendly exchange. In reality much of the dialog is scripted – the Starbucks employee is following a predefined communication pattern. Someone back at Starbucks headquarters successfully encoded that script so that it is easily learned and executed by the typical Starbucks cashier. Contrast the Starbucks encoding to another cashier with poorly encoded materials who curses their point of sale system as they cannot find your purchase price nor get your credit card to run.

Prescriptive work makes up just a small fraction – probably less than 5% -- of the work in a large and mature corporation.   However, the leverage is very high and the impact on next generation success is huge. Companies can earn strategic competitive advantage by carefully monitoring validation results and carefully staffing the positions that encode predefined tasks for future productive work. In small or new companies, prescriptive-actipraxis activity may be a part of every supervisor's day as he/she provides on the job training to workers in advance of every new situation. The script is usually something like "Oh, this is different…Well, I see what to do … Watch me … Any Questions? … so do it like I just did … and come tell me when you are finished with this batch." Validation occurred when the supervisor did the task – heretofore not predefined -- the first time; encoding occurred as the employee watched the supervisor; and the employee has a new predefined rule to repeatedly apply.

DISCOVERY WORK

The preceding discussion of prescriptive-actipraxis activity consciously assumed that the validation would be successful. But, success doesn't automatically happen – it is most likely the result of some prior work. We call that prior work *Discovery-actipraxis* activity. In the supervisor example from the preceding section the supervisor had the answer in seconds so the discovery-actipraxis activity was nothing more than perhaps a quick recall from memory or a simple deductive joining of two principles. Most discoveries take much longer; examples abound from the chemical and pharmaceutical industries where discovery-actipraxis activity takes years or decades. Leifer et al [2000] chronicles a DuPont chemical biodegradable packaging innovation that has spent 11 years [and counting] in discovery-actipraxis work. Discovery periods for problems – such as determining the most time efficient means of getting euro currency in Denver – may take minutes, hours, or days.   Discovery periods for projects – such as devising a

spreadsheet billing system from the output of a call record computer program -- can be hours, days, weeks, or months. Discovery periods for new products and services typically range from one to several years. This section describes the activity of a person or team during a discovery process lasting a week or more.

Discovery work always involves complex tasks and novel problems. Not only is the task without any predefinition, but at the onset there are more unknowns than knowns. Such challenges invigorate some workers and intimidate others. Discovery work will require a worker who is comfortable with complexity and sometimes being wrong. A worker who is motivated to increase his/her effort in order to increase performance on predefined productive-actipraxis activity, may be frustrated when a similar increase in effort does not yield improvement on discovery activity. The complexity of the discovery task is increased by factors such as:
   - the number of variables;
   - number of inputs, outputs, and sensory functions;
   - the number of subtasks or number of steps;
   - judgment guidelines that must be from other sources;
   - inexact or unknown means-ends connections;
   - path goal multiplicity [are there several ways to accomplish the same result];
   - negative relationships among desired outcomes; and
   - lack of or ambiguous structures.

Detailed research on the discovery-actipraxis work style is limited. Campbell [1988] was an excellent resource with his descriptions of 4 types of discovery: *Decision Tasks, Judgment Tasks, Problem Tasks,* and *Fuzzy Tasks*. Identification of appropriate discovery type depends on whether:
   - A *Problem Task* has multiple potential ways [paths] to arrive at the desired end state. For instance, a jig saw puzzle could go together in any order. Other examples are chess problems, event scheduling, and product repair.
   - A *Decision Task* has multiple desired outcomes [end states] one of which is optimum. For instance an automobile can have many different tail light designs, but one will sell best. Other examples are employee selection, choosing a house, selecting a building sight.
   - A *Judgment Task* has uncertain or at best probabilistic linkages among paths and outcomes. For instance, choosing a vendor between one who has a reputation for high quality and on time delivery while the other has a reputation for low cost. Choosing either path influences the product/service of which the vendor is an element. Other examples are intelligence analysis and stock market analysis
   - A Fuzzy Task has conflicting independencies among paths and outcomes. An example of this is the decision whether to purchase a franchise. Buying a franchise is the quickest way to get into the fast food business. However freedoms are limited, big upfront fees are required, local market needs cannot be addressed, and competition from identical franchises can be intense. On the other hand, risk of failure is higher with an independent fast food establishment and the final value at exit may be less. Engaging a franchise broker requires an upfront fee and will result in some high-pressure sales tactics that may influence the outcome, but will yield some interesting data and perspectives. What hypothesis will be tested next? Fuzzy tasks are generally associated with business ventures.

The process of discovery work is all about running experiments, of accumulating the successful outcomes, and of embracing the failures for the value of what's learned. Discovery work is often nicknamed "trial and error" or "probe and learn." A visual metaphor of the discovery process might be to imagine having to find one's way out of the Grand Canyon from some random starting point that is not on an established trail. Multiple routes may exist with one surely easier than the rest. Following one's first instincts might seductively lead to easy terrain. At some point however, impassible canyon walls will force backtracking. Multiple trials will lead to multiple errors. All the while precious resources – eg water – will be in shorter supply. The best route may have the most unusual start – perhaps downhill rather than uphill.

Like a fractal, discovery work is recursively self-repeating. The discovery process starts with a very simple macro-level route-plan from start to finish. The first step of the route-plan is decomposed into appropriately detailed still-

sequential mid-steps. And the first mid-step is further decomposed into a series of independent micro-steps that can be worked in parallel.   A hypothesis is selected for each micro-step and a simulation is run to validate [as in prescriptive work] the hypothesis. [A new product development/discovery program may ultimately examine thousands of micro-steps and tens of thousands of hypotheses]. If the validation is successful, the success is logged. If the validation fails, the simulation is declared a failed experiment. Initially the validations score a high percentage of successes. As the route-plan unfolds, constraints get tighter and failures are more frequent. Failures require a new hypothesis be tested, assuming a new hypothesis remains available. If no additional hypotheses are available, then the defining micro-step and its parent mid-step are declared dead ends. The entire process must back up perhaps requiring re-planning even at the macro-step level.   Retracing generally invalidates other micro-step hypotheses and mid-step successes. Conventional wisdom – backed by detailed numerical study -- holds it is best to find failures as early as possible. Studies from the automotive industry reveal that a single late-stage micro-step dead end can impact a thousand other successful decisions.

The hypotheses to be tested may take a variety of forms. If the discovery is about getting a product or service to market, one possible hypothesis would be to "partner with company A"; or if "A" says no-thanks, then try partner with "B". If the discovery is about solving a web page problem with a software routine, the hypothesis might be that a certain syntax choice is correct. If the discovery is about curing a troublesome ache or pain, the hypothesis could be that the data from a certain test will yield discriminating data. If the discovery is about raising funds for a startup, the hypothesis could be that a certain investor will find the business-plan compelling. Should the investor/business-plan hypothesis prove to be wrong, the startup might either try another investor or might modify the business plan [or do both]. Thomas Edison's discovery was about finding the right physics for the light bulb. In total he tried over 10,000 different hypotheses, backtracked dozens of times, and was fortunate to have found a design that ultimately worked with alternating current as well as the direct current path he chose.

Measures for and monitoring of discovery work is inexact. Productivity is rarely measured and those involved with discovery work are always quick to argue that uncertainties render productivity measures subjective. Financial budgets exist, but are usually amended whenever the case can be made that additional resources will improve odds of success or shorten time to completion. Completion date is arguably the most watched measure. Large discovery work efforts include regularly scheduled checkpoints to routinely monitor progress. But even when completion dates are missed, it does not mean failure for discovery work – if the presumed benefit is sufficient. In 1996, Starbucks launched a quest to find an eco-friendly coffee cup. Early trials were rejected because they crumpled easily or smelled bad. Along the way, the discovery work had tried several different suppliers and realized that FDA approval was necessary.   Finally in 2006 the project delivered and a cup was launched with 10 percent recycled fiber.

Discovery work is different from productive work because there are no predefined rules to follow. However successful discovery work can lead to subsequent prescriptive work that yields predefined rules for repetitive productive work. Obviously successful validation is the goal as the "back to the drawing board" step is very expensive in the case of a failed validation.   Discovery work is also different from assistive work since there is no identified recipient of assistance. Yet, discovery work is often a component piece of an assistive encounter. Some small-scale discovery work occurs during the problem-solving step of assistive work. [Problem solving discovery work for an assistive encounter is applied to a single problem event while problem solving discovery work that is a precursor for later prescriptive and productive work will be highly leveraged across multiple events.]

In summary, predefined rules don't exist beyond the established frontiers of geography, technology, science, business models, and operating paradigms. Natural events [hurricanes, avalanches, epidemics, etc] also have a way of interrupting normalcy and creating situations without predefined rules. In these situations new rules have to be discovered and then prescribed through validation and encoding for future productive-work. The goal of discovery work is to -- as quickly as possible -- uncover the recipe. Experimentation, which by its very definition itself is not a productive work style, is the underlying foundation of discovery work.

INSPIRATIONAL WORK

Throughout the past three sections we have been progressively defining a series of actipraxis activities that are essential precursors to productive work. In order to have predefined rules for the execution of productive work, those rules must be encoded and validated – prescriptive actipraxis activity. But before the rules can be encoded and validated, they must be determined through discovery-actipraxis activity. There remains one additional step: inspirational-actipraxis activity. Everywhere one looks, people are busy. Teams don't exist simply waiting for the next discovery work assignment, nor do individuals have idle moments waiting for the next discovery opportunity. In order for discovery work to occur, a conscious assignment [either self assignment or delegation] and re-allocation of time must occur. Time generally gets allocated according to some priority system, so somehow the discovery work must achieve a higher priority than alternatives. We have seen how assistive work can launch discovery work because the recipient's need sets the priority. The other way to launch discovery work is through successful *Inspirational Work*.

Inspirational work has a beginning and an end; it begins with a central idea and concludes when the appeal of the idea is sufficient to divert resources necessary to initiate discovery work. The idea does not have to be original; someone else could have had the first authorship. Charles Babbage had ideas about programmable computers long before the technology existed to let him build one. Thomas Watson of IBM simply had the derivative idea that Babbage's dream could become a reality. The idea can be expressed with negative logic: "if we don't cut spending 10 percent we will go out of business". Or the idea can be personal and/or singular: "I want to go to Las Vegas this weekend". But if there is no central idea then there is no essence to which others can be inspired. In each of the examples, discovery work is the next step – assuming the idea has sufficient appeal to allocate the time: Watson had to find the right combination of 1940's technology; a brainstorming session to identify spending cuts; a visit to a travel website to discover prices, times, and availability of flights, rooms, shows, and cars.

Much is written yet little is known about how ideas arrive in the conscious mind. Consider the following snippet about Philo T Farnsworth the inventor of the television:

> … He was nervous and tightly wound. He rarely slept. He veered between fits of exuberance and depression. At the age of three, he was making precise drawings of the internal mechanisms of locomotives. At six, he declared his intention to follow in the footsteps of Thomas Edison and Alexander Graham Bell. At fourteen, while tilling a potato field on his family's farm in Idaho, he saw the neat, parallel lines of furrows in front of him, and it occurred to him--in a single, blinding moment--that a picture could be sent electronically through the airwaves in the same way, broken down into easily transmitted lines and then reassembled into a complete picture at the other end. He went to see his high-school science teacher, and covered the blackboard with drawings and equations. In 1925, at the age of nineteen, after dropping out of college, he impressed two local investors with his brilliance and his conviction….

Creativity peaks early – some say first grade. After that life becomes increasingly structured. Grade school and High school train us with a logical rational mode of orderly reasoning and thinking. As people develop intellectual discipline and rigor the brain automatically filters ideas before they ever reach the conscious. By adulthood true creativity is only found in a small subset of population who can selectively disregard processes and predefined rules, thereby letting creative thoughts be recognized. There are proponents of a *creative process* that unfolds in the following order …

> (i) *Preparation* (preparatory work on a problem that focuses the individual's mind on the problem and explores the problem's dimensions).
> (ii) *Incubation* (where the problem is internalized into the subconscious mind along with a desire to do something about it).
> (iii) *Intimation* (the creative person gets a 'feeling' that a solution is on its way).
> (iv) *Illumination* / I*nsight* (where the creative idea bursts forth from its subconscious processing into conscious awareness).
> (v) *Verification* (where the idea is consciously verified, elaborated, and then applied.

Those who are happy and successful in a productive work environment fail first at the incubation step, as they have no desire to alter the predefined rules that are making them successful. Consequently, those individuals that have less

invested in the status quo are more likely to see that the current rules no longer define a playable game and conceive another set that can replace them.

Thomas Edison use to say, "Genius was 1 percent inspiration and 99 percent perspiration. That 99% means a significant commitment of resources and time. If the additional resources and time are to come solely from the inventor they must ask themselves the question whether there are other priorities [such as an earlier idea or necessary traditional employment] that prevent them from moving forward at this point in time. If so, the best they might manage is to record the idea in a journal for re-visiting at some later point. Truly creative people I have met tell me they have ten, twenty, forty projects all captured and just waiting to be worked on. Artists – art, music, poetry, … -- belong to the inspirational-actipraxis-work-type since they are rich with ideas. Unfortunately, many lack discipline, patience, or interest in promoting their work. As a result, many fine works of art sit in studio's waiting to be found. Tinkerers – the inventor working in his garage -- belong to the inspirational-actipraxis. Similar to artists the tinkerer is weak at promoting their work and frequently only they benefit from the value of their inventions.

If the idea will be worked on by a team – doesn't matter whether in startup fashion or as a project in a larger company – the 99 percent perspiration begins with getting others to pay attention and making the idea appealing enough to divert resources toward further development. We call this phase *championing* or promoting. First to be convinced is always the originator of the idea. The challenge is to get others equally as excited. Others must be 'sold' -- a necessity even when the innovator has initially been handed the area as an assignment. Studies of innovation show the importance of backers and supporters, sponsors and friends in high places. These are not singular sponsors, but rather the support of a whole coalition. The idea must compete in 3 'markets' against other ideas and against other status quo uses of resources: 1] a Knowledge Market where the practicality of achieving the idea will be scrutinized, 2] an Economic Market where resources will be awarded to work with the greatest economic value, and 3] a Political Market where personal and organizational gains and losses come into focus. In each situation the idea's champion must deliver convincing, unwavering arguments of support. Excellent persuasion skills are important. And, the champion must be a true believer and must persevere even when hearing "no" multiple times. If the champion backs away in the face of adversity the opportunity to take the idea to the next stage of development will be lost. We believe championing is the most important element of inspirational work.

The fairy tale example of idea championing is the 3M story of post it notes. 3M chemist Spence Silver invented the glue for post-it notes but was uncertain of an application. He promoted his invention throughout the organization but still no application was apparent. Had Silver given up and discarded his championing role, the invention would have been shelved. One day 3M executive Arthur Fry needed a bookmark for his choir hymnal and remembered Silver's invention and persistent championing. The rest is history. Fortunately, 3M has a culture that encourages ideas, champions, and new business opportunities.

Earlier in this section we introduced the concept that highly structured businesses inhibit ideas because workers are encouraged to focus and think within the boundaries of the existing rules. Highly structured businesses are also more difficult environments for champions to gain backing and support. First, overly elaborate and finely detailed structures and systems make organizational participants unable to notice shifts in their environment and recognize the need for innovation. Second, the Economic Model of further investments in the existing business will always look better than the new business in the first couple of years. Third, high structure correlates with high political power making it more difficult for a new idea to fairly win support.

The United States is somewhat unique among industrial nations for strong support of entrepreneurism. Much of that support is due to the way the US capital markets function. And much of the success in the US is due to an immigrating population that in a self-selecting way is sending a higher percentage of workers with good inspirational work skills. Another significant factor is the positive reputation in US society for those who do inspirational [and related discovery] work.

RELATION TO LIFECYCLE

The preceding sections identified 5 actipraxis activities broadly segmented by the existence [or not] of predefined formalizing rules to guide the task. Productive work forms both the foundation of the model and of delivery of value in contemporary economy. Productive work provides the basis of much revenue and profit. We then proceeded to discuss 4 actipraxis activities where the predefined work rules did not exist. This meant that workers had to take initiative to make their own choices using their judgment. There was a unique reason for each of the 4 actipraxis activities. We first examined assistive work that arises when repeating the predefined rules is not sufficient to satisfactorily solve a recipient's need. Then we continued on to explore how collections of predefined rules for various tasks came about to begin with. Chronologically we worked backward. In this section we turn the order around and work forward. The best place to start is with the concept of lifecycle. The example chosen for this section is an ad-hoc neighborhood group seeking an improvement such as speed bumps to improve traffic safety.   The same lifecycle concept applies for just about any individual project, for a non-profit, for a government agency, for a startup, for a neighborhood sports team, etc. Companion papers on CycloPraxis by Johnson [2003, 2005, 2006] rigorously apply the lifecycle to the commercial business unit.

The simplest concept of a lifecycle has 4 phases: startup, growth, maturity, and decline. Researchers have extended this basic concept into 5, 7, and even 11 steps. For our purposes, we wish to remain relatively simple and suggest a model with 5 steps and easy to remember names. The first lifecycle stage is Authoring [A – for short]. This is where an innovative idea is championed and developed and where the project is initiated. In our example, one neighbor has the idea and recruits the rest to join the cause. The second stage is Building [B].   In our example, this amounts to getting the city to initiate, design, and install the project. In commercial situations this is when innovations become products, early customers partnerships form, markets explode, operations begin, finance and quality and human resource functions begin, first processes are initiated. Next in a commercial business comes the need to maximize output in a stage called Capitalizing [C]. For our example, the capitalizing stage includes the day to day monitoring of the effectiveness of the improvement measures. There might be some reports or periodic reviews.   In this stage the business unit reaches its full potential, generates the most substantial profits or best resource utilization, repeatedly wins customers and delivers maximum value. Since all contributions someday diminish in value, the smart business will begin Diversifying [D] by leveraging the rewards of capitalizing business units. Finally, every institution reaches its peak and begins a long and slow Extending [E] stage. For our example project, this could be ongoing maintenance and repairs of the improvements that increase the lifetime of the solution. In business, marketplace rewards erode as demand falls and remaining competition intensifies due to standardization, saturation, and better performing alternatives. The business unit focus shifts from customer acquisition to customer retention.
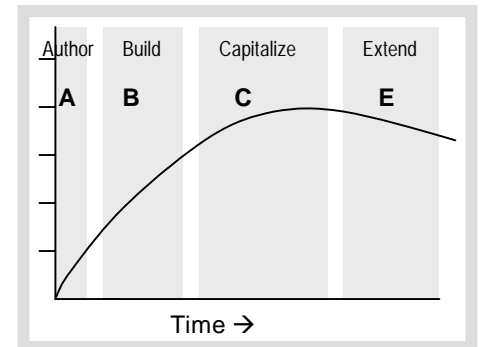
As an initial point of reference, it should be obvious that the capitalizing stage is predominantly comprised of productive work. Absolutes aside, not all of the productive work occurs during capitalizing and during the capitalizing stage there are small amounts of inspirational, discovery, prescriptive, and assistive work. For instance the neighborhood improvement project may need different signage in the midst of the capitalizing lifecycle stage. In a commercial business context a customer may need a special order requiring members of the business [or project or team or etc.] to engage in assistive work. Or once again in the midst of the capitalizing lifecycle stage, an employee team may suggest an improvement to a work method necessitating some prescriptive work of validation and encoding the improvement to a new set of work rules that will replace the old work rules. As a final example recall from the inspiration work discussion the idea of traveling to Las Vegas. After authoring the idea, building the excursion [discovery through on-line research and prescribing the itinerary by buying the tickets], the happy traveler gets to capitalize on the idea and take the trip. While in Las Vegas, the traveler may spot a more attractive alternative hotel and again undertake inspirational, discovery and prescriptive work. Absolutes aside however, the capitalizing stage is mostly productive work.

Perhaps the correlation is obvious. The authoring stage requires mostly inspirational work. The building stage requires mostly discovery and prescriptive work. Logically there will be some productive work in each of these stages. For instance a worker in the building stage takes a business trip to visit a potential partner, vendor, or customer. Upon return, the worker is required to fill out a travel expense reimbursement [TER] form. That TER activity follows a predefined set of work rules and is clearly productive work.

Assistive work is more evenly spread across the building, capitalizing, and extending lifecycle stages. A typical example during the building phase is when someone with specific expertise [an expert] is asked to temporarily join a project team in the midst of building activity. That expert has been asked to help in a situation where there are no predefined rules. During the capitalizing lifecycle stage there are numerous opportunities for assistive work. A customer may have a special request at the time of their order, a huge purchase may request an off schedule discount, an latent defect may be discovered and an early purchaser calls to ask about an extended warranty, or an expert may be called in to troubleshoot operations problems caused by switching vendors. As might be expected, assistive work is most prevalent [reaching the highest percentage of overall work] during the extend lifecycle phase. During the extend phase new customer acquisition has dropped off making customer retention relatively more important. Providers are willing to sacrifice productive work efficiencies to retain customers; customers realize the shift in buying power to their side; so assistive work becomes a preferred provider response. Consider the example of teaching in the public school system compared to teaching in a private school. The public school system has a steady stream of customers [students] and can therefore operate predominantly with productive work. A private school has to compete for students and one key competitive advantage is to promote a higher mix of assistive work. [Note, public schools are supposed to provide assistive work if asked].

The natural alignment of actipraxis activities to lifecycle of a business or project is called *CycloPraxis.* "Praxis" is one's "customary habitual practice or conduct", meaning the way a worker naturally does things. Adding "cyclo" infers there is a dominant praxis for each lifecycle stage. CycloPraxis semi-personifies the work at each stage by suggesting there is authoring work, building work, capitalizing work, and extending work involved in any business or project. An obvious conclusion is that businesses will be most competitive if they staff each lifecycle stage with workers who are skilled and passionate about the work type that is dominant in any given stage. The concept of cyclopraxis is extensively developed in a series of papers cited in the references section and available at www.cyclopraxis.com.

Segmenting Work by *CycloPraxis*

ActiPraxis extends the same fundamental work-types model in places where the concept of the lifecycle is not so apparent: working in a hospital, selling real estate, construction trades, volunteer organizations, etc.
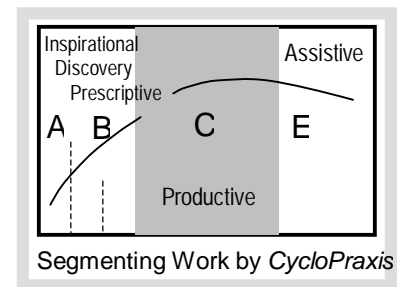
ENCOURAGMENT WORK

A sixth work type was identified in the introduction of this paper, but has not been mentioned since then. The sixth work type is *Encouragement* work. Encouragement work is practiced in every cyclopraxis lifecycle stage and in parallel with most actipraxis activities. Encouragement work is vitally important to managers or those operating in a managerial capacity. Encouragement work is also found in negotiation and selling which are two other very person to person focused activities whose goal is to channel the behavior of another person toward a specific goal. For the sake of simplicity, this section will focus on encouragement work in the employee-supervisor scenario. Encouragement work is always unique to the situation and is best executed with careful listening and observation of the employee by the supervisor. Supervisors who are capable of *transference* [e.g. "walking in the shoes" or "sitting in the chair" of the employee] realize top results with encouragement work.

Recall from assistive work discussion that the value of a happy satisfied recipient could be more important than loss of efficiency from abandonment of following normal predefined rules. A similar logic exists with encouragement work. The positive attitude of the employee, sales target, or negotiation adversary is more important than a short-term loss of efficiency. Consider for example a supervisor who observes an ill employee and using productive work grants time off to recover [perhaps an afternoon with pay]. Surely the supervisor is not following any predefined rules and furthermore productive work quotas will not be met that day. However, the employee may so appreciate the gesture that he/she works 110 percent for the next two weeks. Recall also from assistive work that the situation requiring assistance is unique to the recipient and not generalized across all possible customers. A similar logic exists with encouragement work. Each employee is a unique personality with his or her own individual motivators and demotivators. While an encouragement work activity providing special recognition may exceptionally motivate one employee, a second may feel little value from similar recognition. The same second employee may find a thoughtful caring visit with his or her supervisor to fulfills their special need. The key point is a uniquely individual approach best executed with supervisor transference.

Some might equate encouragement work and leadership. Actually, encouragement is one component piece of leadership.   Inspiration is the other component piece.   Inspiration includes the courage to go where others have not ventured, to persevere by turning a deaf ear on those who say can't, to champion, and to rally a coalition in support of the campaign. Where inspiration work is impersonal, encouragement work is personal. Encouragement work uniquely evaluates each individual and executes a custom plan.

Some might equate encouragement work and management. Actually, encouragement work is one key component piece of management. Structure is the other key component piece. Structure is the activity a supervisor undertakes when they organize a group's activities. In the plan-organize-delegate-control management model, structure is planning and organizing.   Planning and organizing either follow predefined rules or are addressed in trial and error fashion, both of which are impersonal with respect to the employee. Personal interaction and the opportunity for encouragement work enter during delegation and remain through control. Researchers have called encouragement work "consideration" with the definition: behavior indicating mutual trust, respect, warmth, and rapport between supervisor and employee.

It is especially interesting to examine encouragement work in relation to the Situational Leadership task-relationship model of delegation Hershey & Blanchard [1969] shown at the right. The actipraxis work-type that results in *telling* management style [S1] is a simple productive work type. The supervisor may even say "the rulebook says do …". Moving to the *selling* delegation style [S2] invokes a sales technique, which involves inspirational work as in the supervisor championing his/her idea and involves encouragement work where the supervisor observes the employee's attitude and adjusts what is being sold and how it is being sold. Impersonally the goal is to get the employee to accept the work. The selling management style adds the unique to each individual personal dimension of encouragement work. The *participative* delegation style [S3] is most effective when the supervisor is a good listener and asks questions -- in a manner that the employee finds supportive and helpful -- that expands and/or ratifies initiatives already being proposed by the employee.
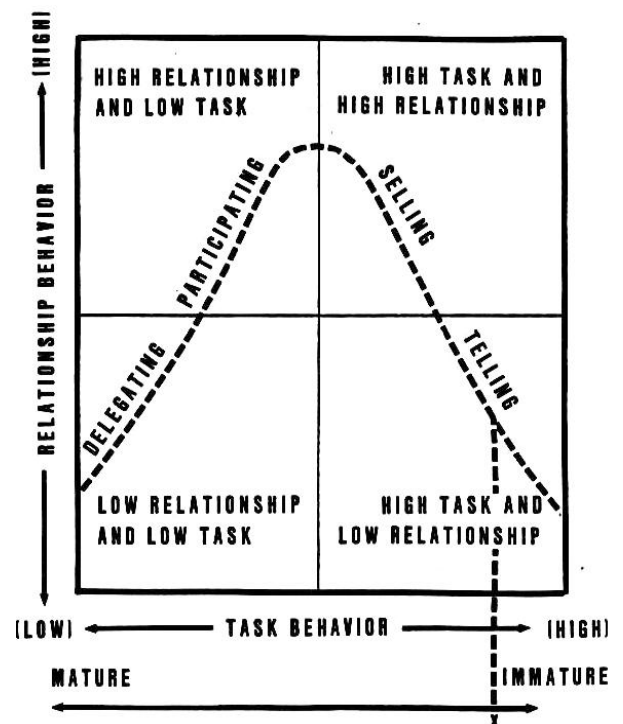
Control -- the final step in plan-organize-delegate-control -- can also be done in a variety of manners. Simple impersonal weekly reports following a department template are certainly representative of the productive-actipraxis

work-type. Where control activity involves personal interaction between employee and supervisor the control work take advantage of the benefits of encouragement work – especially when accompanied by transference. Once again best results follow from uniquely individual interactions.

Encouragement work is aptly summarized by the metaphor of "compromising in battle in order to remain victorious in war." The compromised 'battle' may be the efficiencies of productive work, the time goals of discovery and prescriptive work, or even further extending the generosity of assistive work. The 'war' is continued employee attention and devotion to the organization and its business. Alert supervisors can monitor individual situations during interpersonal encounters and through short-term results. Long-term measures of success – such as turnover, output, and competitiveness of the enterprise -- are much more indirect and difficult to quantify. With increasing focus on quarterly results, encouragement work may be receiving too little emphasis. For instance, more than half of American workers are not engaged in their jobs, according to a recent survey by Gallup. Most are "sleepwalking through their workdays," Gallup says. And 17 percent are what Gallup calls the "actively disengaged." The 23 million "actively disengaged" U.S. workers cost the national economy about $370 billion a year in lost productivity, Gallup says.

NATURAL FORCES

For completeness, we must mention once again the last reason for which no formalized rules exist. Certain jobs include situations where natural forces trump any formalized application of rules. For instance a farmer may prefer to follow a planting rule and plow fields on a particular morning. However a previous night's rain may leave the fields too muddy. Or a wildlife researcher wishing to study a migratory animal may show up for work only to discover the migration is early, late, or altered in some other way. In both these examples a natural force has disrupted the expected application of formalized rules.

INTERESTING ADDITIONAL CLASSIFICATION VARIABLES

Recall that the classifications are often done to suit the needs of the classifier. A wide variety of variables are studied such as: teamwork, initiation, role of hierarchy and structure, role of feedback, level of judgment, communications, polycronicity [number of activities done in parallel], and learning requirements, time envelope, consequence of errors, impact on others, and importance to the organization.

The *initiation* topic warrants further discussion.   A possible segmentation is: Reactive, Proactive, and Persuasive. Assistive-actipraxis activity is always reactive. The recipient makes the request of the responder. Reactivity is built into the definition of assistive work. Most productive-actipraxis activity is also reactive unless the productive work is done in solo fashion in which case the worker must initiate. For instance, those working on an assembly line are reacting to the requests of the hierarchy, while someone who is training for a weekend marathon must initiate each exercise session. Discovery and Prescriptive actipraxis activities are generally self-initiated. That's because as any recipe is being established, no one can describe the steps to follow, they must be initiated based upon current challenge plus past results. Inspirational and Encouragement actipraxis activities tend to be persuasive. The persons engaged in Inspirational and/or Encouragement works are frequently trying to get others to adopt some lead.

The *impact on others* topic – synonymous with leverage -- also warrants further discussion.   Assistive-actipraxis activity generally benefits just one person so the impact on others is one-to-one. The leverage is unity. Productive-actipraxis activity has a predefined impact which can range from simple unity [where costs of labor are recovered] to very high leverage that woven into the responsibility of a key department chief. Prescriptive actipraxis activity has high impact on others since one person defines rules that are followed – leveraged -- many times over. Discovery work – when successful – also has similarly high impact. Inspirational-actipraxis activity, with a key mantra of "change the world" has extraordinary leverage when successful. Much inspirational work however fails to gain

traction and defaults to zero leverage. Encouragement-actipraxis activity has medium to high leverage [depending on size of staff] because the investment of supervisor time with a worker returns significant productive benefits.

And finally the time envelope topic warrants further discussion. Assistive-actipraxis work deals with the recent issues of the recipient. Since satisfaction of the recipient is a key metric, it is tempting for assistive workers to invest considerably more than 'just enough to satisfy the issue' on the assumption that continued investment builds additional satisfaction [that assumption would not be true for those in a hurry or for those for whom a 100 percent solution was found early. Productive-actipraxis activity is time efficient – time is money. The focus is on the current accounting period and trying to make that period slightly better than the previous period. Inspirational and prescriptive actipraxis activity considers future repetitive rules that will be executed far into the future. As a result, these activities are usually very time urgent, a fact that is visibly reflected in the work styles of the participants. Discovery work and Encouragement work are also executed with the future in mind. However, sufficient time must be permitted for both effective discovery and for employees to internalize a manager's messages.

ACTIPRAXIS RELATION TO STAFFING

In physics 'work' equals 'effort'. Not so in the human world. A worker who is good at assistive work activity may accomplish desired customer satisfaction with minimal effort. That same worker may be less capable of prescriptive work and undertaking even a simple task may require a great deal of effort. In a previous section called "Relation to Lifecycle" the cyclopraxis relation between actipraxis activities and business lifecycle was identified. That discussion continues in this section.

Authoring it the name given to the initial business lifecycle stage. The key work that must occur during this initial stage is the inspirational activity of idea creation, idea promoting, and idea championing. Those who undertake such inspirational activity with little effort, we call *Authors*. They are twice, ten times, or more as effective at inspirational activity. Building follows authoring. The key works that must occur are discovery [often called development, engineering, or design] and prescriptive [building a proven recipe for others to repeatedly follow]. Those who undertake discovery activity and prescriptive activity with little effort we call *Builders*. Once designed and proven, the business enters the capitalizing stage. During capitalizing productive-actipraxis activity is the predominant work makeup for most businesses. Those best suited for this work are *Capitalizers*. They will get the job done with less personal effort than a Builder or Author. Businesses offering highly customized services are the exception because they have a relatively high percentage of assistive activity combined with productive activity. Ultimately, a business enters the extending stage where maintaining relationships with existing customers is essential to continued existence. While productive work remains significant, customer satisfaction grows in importance and assistive activity may become dominant. *Extenders* possess the appropriate skills and motivations to excel at assistive work with little effort.

The preceding paragraph suggests absolutes that might not properly represent reality. For instance in the capitalizing and extending lifecycle stages there is a small amount of inspirational, discovery, and prescriptive activity associated with re-engineering and continuous process improvement. And in the early stages of authoring and building, there is some productive work [such as preparing and filing tax returns]. However there is a considerable difference in the effort required for an Author to file a tax return versus a capitalizer finance professional. Finally, as mentioned previously encouragement activities are present in every lifecycle stage.

Authors: Individuals who are good at pattern recognition, big picture, futures, and ideation; and who have the internal confidence to influence others and build momentum toward those ideas are the world's authors. The Author's recruiting message is "join me and we will change the world". When asked what drives them to take the risk one Author responded:

"I see something no one else does and I know it's doable because I have confidence in my abilities that I can do it even though no one else is doing it. So you see, there is no risk because I CAN do it."

Authors have the beliefs that what they believe in is correct, that the present rules impeding their idea will be overturned, and that they personally can prove it. When an Author is presented with discovery, prescriptive, productive, or assistive activity, they respond with disinterest. It takes great effort to make them undertake such work. Discovery work is unattractive because the requisite experimentation will have some percentage of negative outcomes that serve to contradict the ideas that Authors believe are correct. Prescriptive work is unattractive because every little detail needs to be worked out. Great effort is required for the Author to work details instead of their preference for big picture. Productive work means following pre-defined rules and in some cases the very pre-defined rules that the Author believes should be changed. And from the perspective of "change the world", assistive activity has trivial leverage. Authors also look upon those asking for help [something an Author rarely does] as a sign of weakness and seek to disassociate themselves from needy recipients. Before leaving the topic of authors, we should add that Authors usually are not effective at encouragement work; empathy and transference are not well-developed skills.

Builders: Individuals who are good at problem solving, have a tolerance for ambiguity, are self-confident with high self-efficacy, challenged by deadlines, full of boundless energy, and motivated by accomplishment are the world's builders. Builders search for underlying principles and develop expert knowledge structures most rapidly. Builders are rabid learners unfettered by typical anxiety, defensiveness, rigidity, or making mistakes learning inhibitors. Builders thrive on learning what is not previously known -- often through trial and error – and then sharing that information with others. Builders prefer designing and assembling something for others to use to using it themselves. These characteristics make the Builder the most effective at discovery and prescriptive activity. When a Builder is presented with inspirational, productive, or assistive activity, they respond with less interest. A Builder's inspirational activity is ineffective because without performing significant discovery activity [experiments, trial and error, probe and learn], the Builder is reluctant to champion or promote the idea. Builders are impatient with productive work because the very skills that make them most effective at discovery and prescriptive work are being ignored -- just as any animal out of its element is the proverbial fish out of water. When a Builder needs assignment to another actipraxis activity, assistive work is the best. Assistive activity at least engages the Builder's problem solving interest and skill. Customer satisfaction objectives may not be met, however, as the Builder will likely introduce time urgency and completion closure beyond what the recipient expects. Before leaving the topic of builders, we should add that Builders usually are not effective at encouragement work; time urgency and task orientation are prioritized before the other person's psychological needs.

Capitalizers: Individuals who are energized by structured environments, predictable situations, well-defined expectations, continuous improvement, well-understood rewards, and predefined rules for every probable situation are the capitalizing population of the global economy. Teamwork and social acceptance are often important. Repetitive activity is not a requirement for the Capitalizer, but repetitive work often the results from application of the Capitalizer's interests. These characteristics make the Capitalizer most effective at productive work. And these very same characteristics make it very difficult for a Capitalizer worker to perform inspirational, discovery, prescriptive, or assistive work. In order to perform such works, the Capitalizer must invest tremendous effort, just as a fleet footed racehorse labors while swimming. Years of practice habitually excelling under the constraints of predefined rules renders nearly impossible any conscious recognition of new ideas that disregard those very same rules. Having a Capitalizer perform inspirational work is nearly impossible. Similarly, running the experiments of discovery work threatens the reflexive continuous efficiency improvement behavior. One failed experiment could devastate the numbers used to measure results. As a result, when a business assigns a capitalizer to discovery activity those capitalizers will endlessly study the challenge seeking to predefine every possible route to the one with highest probability can be the only one attempted. Similarly once again, capitalizers have the reflexive behavior of following rules. Asking them to set the rules required by prescriptive work requires a work pattern exactly opposite their years of training. A Capitalizer faced with assistive work also sees a challenge to productivity. The special request of the recipient will undoubtedly reduce the overall efficiency of the provider. Capitalizers are more interested in their efficiency than the recipient's satisfaction. Some Capitalizers are good at encouragement work in homogeneous groups where transference is easily derived.

Extenders: Individuals who are generous with their time, are good listeners, are energized by helping others, seek to continue the status quo, and strive to belong to groups are uniquely gifted to extend the values of a current offering into the future.   Extenders have special skills – either a technical expertise of some sort, a special ability to read the emotional side of people's difficulties, or a knack for explaining things. Extenders are good at solving problems [thereby extending the pre-problem state which the recipient prefers] either technical, people, or understanding in nature. Extenders jump at the opportunity to react while showing only marginal interest in self-initiation or persuasion. Extenders are OK with productive activity, but only truly energized by assistive work.   And these very same characteristics mean that an Extender undergoes additional effort to do any inspirational, discovery, prescriptive, or productive work. The repeated problem solving nature of assistive activity affords Extenders considerable practice in beyond-the-rules creativity. As a result, Extenders are well qualified for the creative aspect of inspirational actipraxis. Unfortunately, the reactive habits of the Extender impair the persuasion necessary to fully realize inspirational activity. Extenders enjoy problem solving – when the problem is well constrained -- so some elements of discovery work feel familiar to the Extender.   Inevitably however, Extenders have difficulty with the deadlines, required self-initiative, and total ambiguity of discovery and prescriptive situations and they soon opt out of any full discovery and prescriptive challenges. The usual comment is "didn't like the pressure". As noted earlier, an Extender will do productive activity – they just never earn a very good evaluation. The Extender is always looking for their preferred assistive opportunities and readily transition whenever possible. This is the opposite of the Capitalizer who views the assistive activity as a distraction. As a result, the Capitalizer generally earns higher efficiency marks, gets better performance reviews, and is likely better paid.

APPLICATION TO A SAMPLE JOB

In this section we will take an example function/profession of 'sales' and attempt to determine its actipraxis. Since 'sales' includes a variety of subtasks such analysis only makes sense if we decompose the job into those subtasks.   We can readily identify 19 subtasks [readers may be able to identify additional, but the following 18 will be sufficient to make the key points.]

1. Lead Generation [seminars, direct mail, trade show]. Follow formalized methods. *Productive* rule based.
2. Prospecting [otherwise known as cold calling]. If done in a call center manner is following a script and therefore *productive-actipraxis*.
3. Recipe Identification. The process of determining the customer points of resonance for either cold calling or targeted calling is discovery work and *prescriptive-actipraxis*.
4. Value Proposition. When a recipe might be useful with additional customers, it must be encoded which is *prescriptive-actipraxis* work.
5. Socializing the initial connection. If multiple people are involved in the 'buy', then the success of gaining the first person's interest must be leveraged across the buying organization. This is *inspirational-actipraxis*.
6. Pitch. When a formal presentation is required, the encoded value proposition is delivered as in inspirational-actipraxis but with all the awareness of *encouragement-actipraxis*.
7. Change Management. Frequently others in the buying organization do not immediately accept the changes and the sales professional must lead the change management process at the customer site. This is *encouragement-actipraxis*.
8. Event Definition. Customers may decide for a product or service, but lack something that stimulates their action. A sales professional may create an event through *discovery-actipraxis* work.
9. Classic Close. The classic close gains the order and requires *encouragement-actipraxis* work.
10. Terms.   Negotiation of special terms requested by customers is *assistive-actipraxis*
11. Order Processing. The activity of accepting the customer order and entering the transaction into the provider organizations systems generally follows two sets of formalized rules – the customer's and the provider's. The work is *productive-actipraxis*.

12. <u>Persuade Provider Organization.</u> Frequently the provider organization [aka Factory] must be sold on the customer special conditions just as the customer must be sold on the purchase. This internal selling is generally *encouragement-actipraxis* and *inspirational-actipraxis* work.
13. <u>Ready.</u> In a situation where the customer must prepare their people or their site for the purchase, a set of rules are to be followed which is the *productive-actipraxis.*
14. <u>Delivery inquiry or adjustment.</u> When the customer has a question about delivery the reply is usually *productive-actipraxis*. When an adjustment is necessary the work becomes *assistive-actipraxis.*
15. <u>Installation.</u> – if needed -- is *productive-actipraxis* for standard situations and *assistive-actipraxis* for anything custom.
16. <u>Training</u> – when a component element – is *productive-actipraxis* work.
17. <u>Responding to Questions</u> that the customer is either *productive- actipraxis* for standard situations or *assistive-actipraxis* for anything requiring custom replies or actions.
18. <u>Warranty</u> claims follow formalized procedures and therefore are *productive-actipraxis* work.
19. <u>Support</u> is usually meant to describe custom requests and actions and is therefore *assistive-actipraxis* work.

The preceding suggests that a complex function/profession is not a single actipraxis but rather a collection of a variety of different actipraxis subparts. A particular sales position requiring equal percentages of all subtasks would require a versatile individual skilled in each of the actipraxes. In practice, sales positions often segment into subsets such as market development, expansion, or account executive with accompanying narrower actipraxes distributions. The account executive position is often involved with lead generation, order processing, purchase terms, ready, delivery adjustment, installation, training, and support. The mix of actipraxes is predominantly productive and assistive.

The counter salesman most often responds to questions and then processes the order. The work is certainly productive actipraxis with a mix of assistive actipraxis. The entry-level door-to-door salesman is doing prospecting and order processing plus perhaps some ready and installation work. This is all formalized productive-actipraxis work. The exceptional door-to-door salesmen will read the prospect's reaction and may introduce some encouragement-actipraxis induced departures from the script in pitch and close steps.

The market development sales specialist helps fledgling products find their first customers. Most time is spent in recipe identification, value proposition, socializing, pitching, change management, and event definition. The time spent with actual order processing, installation, training and support is minimal. This sales position is heavily skewed to inspirational and prescriptive actipraxis activity. Productive, assistive, and even encouragement actipraxis works play a reduced role.

CONCLUSION

Work activity outside the classic rule based production type jobs is
not well defined by any existing classification methods. The lack of
an effective classification methodology means that employees,
hiring supervisors, and ultimately entire businesses are unable to
repeatedly specify and assess the employee ← → work-activity fit
beyond function and industry. The result is that an employee with
"A" skills and interests may find themselves in a "B" job. The
common slang for such a situation is "a round peg in a square hole"
Classic examples of " a round peg in a square hole" include

Jobs A & B while from the same function
can be very different

- A top performer, someone who was instrumental in getting
  the business started now just seems in the way as often as he is adding value. Your operating unit has grown and he
  has not by failing to adapt to today's pressing needs.

- Your most successful salesperson in big tough accounts just cannot seem to get a new product category going.
  Other sales reps, in contrast, have gained traction with their accounts and are successfully closing sales.

- A top developer with a solid reputation for driving quality and timeliness in your mainstream product line is
  suddenly struggling with an assignment to productize a new idea.
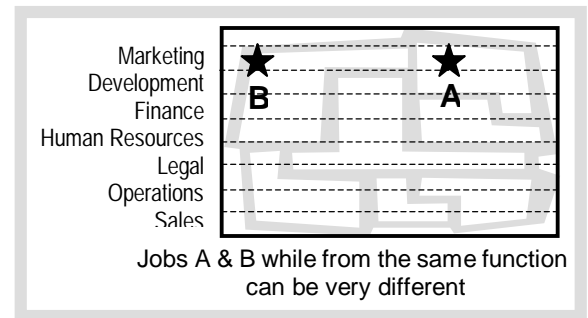
It is doubtful that a single universal classification of work activity will ever be found. Instead, classification systems
exist to serve the needs of the person doing the classifying. For instance, governments look at work activity and
assesses whether it is exempt or non-exempt. HR departments may consider whether work activity is technical or non-
technical and whether senior positions are managerial or influential. We have introduced a new classification of work
based on ActiPraxis. The first segmentation of actipraxis is whether a pre-defined set of activity rules are available.
When predefined rules exist, we call the work activity 'productive'. Further segmentation of productive work is
possible, but outside the scope of this initial paper. Instead we shift the focus to work activity where pre-defined
activity rules do not exist and identify 5 situations that lead to the absence of such rules.

- inspirational - break rules for new, [least common]
- discovery - learn rules,
- prescriptive - validate and encode rules,
- assistive - break rules to satisfy [most common after productive activity]
- encouraging - break rules to motivate.

The ActiPraxis work activity classification has a strong correlation to CycloPraxis. Indeed some might [partially
correct] conclude that actipraxis is little more than a generalization of the CycloPraxis model. In reality ActiPraxis
extends the CycloPraxis model to environments where the concept of a lifecycle makes little sense – environments
such as a hospital, public school, and small professional business [doctor, lawyer]. ActiPraxis also seeks to probe
more deeply and completely into the nature of each of the 6 work types highlighting and contrasting the differences.

ActiPraxis work is unique. A dozen scholars have developed elaborate classification schemes based on 20 to 200
ability, task, and behavior variables. Hundreds of papers have been written about these dozen models. None have
realized any application among business practitioners. ActiPraxis identifies key differences in hundreds of real work
situations and uses those differences to as the basis of this modern day segmentation.

APPENDIX A

Previous classification attempts initially fell into three broad theoretical approaches: *Ability, Behavioral,* and *Task*. We start with a 4th approach. If the reader is further interested, they may follow any of the bibliographies, or seek reviews in Fleishman & Quaintance [1984] or The National Research Council [1999].

WORKER CENTERED: A fourth – worker-centered -- approach has recently arisen which seeks to develop a tool to help workers choose amongst a variety of occupations. This 4th approach is open to reverse engineering of the underlying classification scheme.

The Position Analysis Questionnaire [PAQ] developed by McCormick [1969] is a worker-oriented job analysis technique with a variety of human resources applications. The PAQ consists of 187 items listing work behaviors and job elements at a level of abstraction that permits work to be described across a broad range of occupations.

The Occupational Information Network [O*NET [tm]] is the single most comprehensive classification of types of work and is published at: www.onetcenter.org. The O*NET database takes the place of the dictionary of Occupational titles as the nation's primary source of occupational information. The database and related products helps millions of employers, workers, educators, and students make informed decisions about education, training, career choices, and work. The goal of O*NET is to establish a common language for communication across the economy and among work force development efforts. At the heart is the "Content Model" that provides a framework that identifies the most important types of information about work and integrates them into a theoretically and empirically sound system. The model matches job-oriented descriptors and worker-oriented descriptors. As of 2006, the database contains occupation specific information for 12,000 professions cataloged hierarchically into 974 common framework requirements, attributes, and content plus context of work, using unique 275 descriptors. The sheer breadth and volume of the O*NET database simultaneously limits its usefulness as a tool for helping discover another useful descriptor of the types of work.

The Occupational Analysis Inventory [OAI] is designed to be prescriptive to workers looking for occupational education and guidance. The inventory includes 617 items called 'work elements' divided across five categories: -information received, -mental activities, -work behavior, -work goals, -work context. Study of OAI is principally done by Cunningham [1983, 1988].

The Common Metric Questionnaire [CMQ] was developed by the Harvey of the Psychology Corporation [1993] as a "worker-oriented" job analysis instrument designed to have applicability to a broad range of exempt and nonexempt jobs. Key dimensions are: -general background, -contacts with people, -making decisions, -physical and mechanical activities, and -work setting.

The Work Profiling System [WPS] from Saville and Holdsworth [1990] is a worker-oriented job analysis instrument supported by expert system computer technology. The WPS is organized into two parts: job tasks and job context. The job tasks section consists of 325 behavior description items organized into 8 sections: -managing tasks, -managing people, -receiving information, -thinking creatively, -working with information, -communicating, -administrating, and –physical activities.

ABILITY classifications [such as the present example] look at the skills necessary to do particular job. The primary function of an accounting position would list 'number fluency' as a necessary ability. A dental hygienist job would list 'manual dexterity' as a necessary ability in its primary function. Both jobs could have auditory attention as a key characteristic for interaction with customers that might be a secondary part of their job.

The Fleishman Job Analysis System [FJAS] is based on extensive experimental and factor analytic research on the nature of human abilities by Fleishman and Quaintance, [1984]. This research – conducted over a 40-year period, consisted of a wide variety of laboratory tasks designed to elicit performance from subjects drawing on one or more hypothesized underlying abilities. Fleishman and Reilly are also widely cited for their [1992] publication of a list of 52 human abilities and the accompanying job types. The 52 abilities are subdivided into Cognitive, Psychomotor, Physical, and Sensory-Perceptual skill and provide a rich array of variables by which work activity is described. Psychomotor and physical abilities generally lend themselves to describing

jobs with significant manual or motor content that are productive in nature. Cognitive skills – such as oral expression, fluency of ideas, originality, problem sensitivity, facility, deductive reasoning, inductive reasoning speed of closure – touch upon less well-specified work tasks.

<u>TASK</u> classifications are the most common. High-level tasks are repeatedly divided into subtasks until the smallest unit of predefined rule based activity is identified. Task classifications are designed around a single industry or occupation; the activity of the military is a very common laboratory. Task classifications always have a variable that separates physical activity from mental activity. Physical activity might be further defined by attributes such as strength based, dexterity based, and endurance based. In situations where predefined rules do not exist to guide an activity, the task oriented classification approach cannot be applied. Such rule-less situations lead to the development of behavioral classifications.

A significant theoretical approach to work exists within "Activity Theory". Activity theory, which originates in the works of two Russians: S. L. Rubinshtein and A. N. Leont'ev, provides a framework for understanding the cyclical relationship of action and evaluation as a user applies a tool to accomplish a goal. The foremost English Language authority exits in the textbook by Bendy (1997)The major units of analysis are both cognitive and behavioral and human activity is portrayed as a hierarchically organized structure consisting of conscious goal-oriented actions. A few of the constructs of activity theory are identified below; key words are highlighted:
-   Subjects work on Objects according to Rules with Results following from a series of Actions.
-   Community, Goal, and Motive are specifically defined.
-   Actions can be both mental and physical
-   Actions are constituted of smaller units – individual operations – that can be conscious or unconscious.
-   Feedback is achieved through Monitoring.
-   Object-oriented activity is performed by a subject using tools on a material object
-   Subject Oriented activity involves two or more subjects and is constituted through information exchange, personal interactions, and mutual understanding.
While activity theory appears sufficiently robust to cover many of the actipraxis work types, in practice the vast majority of discussion and application is for rule-based productive work. Bedny and Harris [2004] is an excellent example of a theoretical application of activity theory.

The Multipurpose Occupational Systems Analysis Inventory-Closed Ended [MOSAIC] is to collect data on a number of occupational descriptors in a standardized manner across occupations within large occupational families, and then to provide that information in readily accessible electronic databases.

<u>BEHAVORIAL</u> approaches to activity rely upon the human's ability to scan the environment, to use judgment, to solve problems, and to make decisions. Activity of this nature is not necessarily governed by predefined rules.

R. B. Miller [as reported by Fleishman and Quaintance, (1984)] was a key researcher in the field of behavioral activity classification. Miller defined 25 behavioral variables: Message, Input Select, Filter, Queue to Channel, Detect, Search, Identify, etc. His work is intellectually stimulating but not widely followed. Colleagues who later tried to apply his behavioral classification failed to generate repeatable results. Apparently there are significant challenges in precisely interpreting and measuring the classification variables Miller selected.

Hackman and Oldham [1975] describe 5 key job characteristics.
1. Skill Variety: Skill variety describes the degree to which a job requires the exercise of a number of different skills, abilities, or talents. Such activities must not merely be different, but they must be distinct enough to require different skills.
2. Task Identity: Task identity defines the extent to which a job requires completion of a whole and identifiable piece of work.
3. Task Significance: Task significance refers to the importance of the job; the degree to which the job has an impact on the lives of other people, the immediate organization or the external environment.
4. Autonomy: Autonomy is the degree to which the jobholder is free to schedule the pace of his or her work and determine the procedures to be used.

5. Feedback: Feedback is the degree to which the individual doing a job obtains information about the effectiveness of the performance. Feedback does not only refer to supervisory feedback, but also the ability to observe the results of their work

Unfortunately, Hackman and Oldham's work is limited first by the applying a qualitative scale that is open to differing interpretations by different individuals – two subjects may describe the identical job quite differently based upon their unique subjective scale.

A more generalized and abstract framework for classifying work is to instead classify the personality factors that attract applicants. After years of 4 or 5 decades research, elaboration, and debate, a "Big Five" personality factors for job evaluation were agreed upon in the 1980's. The big 5 are

1. Extraversion [sociability and the disposition toward positive emotions and high activity, particularly in interpersonal relationships; assertive; ambition], Some would split Extraversion into two dimensions: Sociability and Ambition
2. Agreeableness, [trusting, straightforwardness, friendliness, modesty, altruism, cooperative, good natured ness]
3. Conscientiousness [dependability, orderliness, achievement, striving, dutifulness],
4. Neuroticism [emotional stability; stress tolerance; negative indicators: anxiousness, depression, hostility, and vulnerability],
5. Openness-to-Experience [tendency to seek out novelty and variety with a marked preference for complexity; imagination; intellect]. Individuals who are high on openness-to-experience are perceptive in recognizing the emotions of others. They are also attracted to new ideas and alternative value systems making them creative and highly tolerant of others

The big five have been the basis of many research projects such as who discovered 1) a consistent relationship between conscientiousness and all job performance criteria; 2) extraversion is a valid predictor for occupations with social interaction such as managers, and sales professionals; and 3) openness-to-experience is a good predictor for new skills trainability proficiency.

In the [1999] book "The Changing Nature of Work: Implications for Occupational Analysis" the National Research Council offers a framework of four dimensions along which work varies:

1. Autonomy-Control -- The degree of discretion or decision-making power workers have over how to do their jobs.
2. Scope. The range or breadth of the tasks embedded in a job. There is an ongoing unresolved debate over the overall productivity of a narrow constant scope versus new-age concepts of job enlargement, job rotation, and team based work.
3. Complexity. The substantive (or cognitive) complexity, or the degree of cognitive activity and analysis needed to do a job. Job complexity defines depth of expertise needed.
4. Interactivity. The extent to which the quality of social interactions, including their emotional quality, is critical to job performance. It includes emotional labor, which is a relatively new concept and an increasingly well-recognized, if not an increasingly important, component of many jobs in which interactions are critical tasks. Interactivity applies worker-to-worker, worker to customer/client, and worker to boss.

Like many other proposals, these 4 dimensions do more to help understand variations in productive work than they help to define types of work that make up the other actipraxis work types – inspirational, discovery, prescriptive, assistive, and motivational.

For a more complete discussion of various models, the reader is referred to Fleishman and Quaintance [1984] chapters 5, 6, and 7.

SUMMARY

There are hundreds of articles, studies, handbooks, and websites devoted to describing 'work'. Highly theoretical articles dig into behavioral and cognitive psychology. Less theoretical approaches tend toward task inventories and frequently characterize 'work' by personifying attributes of the activities most commonly carried out. Like skilled tasks, abilities, or behaviors are grouped together. For instance, work may be classified as oral if it involves public speaking, radio station announcer, simultaneous translation, etc.   In our view, this approach is compromised by using an object's dependency to define the object in much the same way that describing 'hot' with 'feels-warm-when-nearby' is less defining than specifying '200 degrees'.

In our experience most frameworks are accidentally self-limiting in that they narrowly explore chosen subsets without attempting to place those subsets in a larger context. Most all deal with activity governed by predefined-repetitive-rules. What about the other half of population whose work activity is not defined by rules?

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