BPM for Knowledge Workers:

The Structural Foundations of Decision Intensive Processes (DIPs)

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For many of us, the attraction to BPM follows from the challenge of unlayering and resolving complexity. We revel in creating structure out of chaos. As both an intellectual pursuit and a technological opportunity, BPM is a tool by which to express this passion.

Over the last ten years, my passion has manifested as a practical search into the nature of knowledge and decision making and how it weaves into the workings of the knowledge-based enterprise. The journey has led me to some very basic conclusions that, when looked at rigorously, have interesting implications for the BPM industry:

- There is an identifiable process comprised of functional activities that, regardless of domain of expertise or industry, is used by individuals and organizations to reach decisions.
- As decision volume and importance grows, organizations attempt to scale and improve decision making processes in ways that are intuitive but often become counter-productive.
- The purpose of knowledge is to reach the best possible decisions and subsequently take the most appropriate actions based on the best available information within a required time frame;

This article is the first in a series for BPTrends intended to explore the decision-centric activities of the knowledge-based enterprise. To establish context for this and following articles, I refer to this category of activity by the descriptive name of Decision Intensive Processes (DIPs), which I suggest is a subclass of business process within the BPM domain.

In this article, I want to establish a baseline for future discussion by exploring the structural foundation of DIPs. This foundation is realized as we probe decision making conduct by the expert (as an individual decision maker) and the enterprise (as a multi-person decision maker).

The Drive to Understand Decision Intensive Processes

In November 2006, a BPTrends editorial[i] challenged the BPM community to directly address the unmet needs of the knowledge worker. The editorial made the following points:

- The US is mostly a service economy run by knowledge workers.
- Knowledge workers create special problems for anyone who tries to analyze and automate the processes they manage.
- Defining the specific procedures that individual knowledge workers or experts follow is hard, maybe even impossible.
- Knowledge keeps evolving and procedures are constantly changing, based on new information acquired by the knowledge worker.

This call to arms is motivated by an increased urgency to deliver on the full potential of BPM. To reach that potential, the chorus is calling for greater attention to the human side[ii] of BPM, where gaps in understanding and technique remain[iii].

What makes this call so captivating is that BPM can change the way we perceive the problems of the knowledge worker. Looking at decisions as both process and outcome can change the way we characterize knowledge-based work requirements, measure the performance of knowledge-based tasks, and harness knowledge in the workplace. Organizations are primed to embrace these outcomes for both strategic and tactical reasons.

At stake are the hearts and minds of overwhelmed knowledge workers who are caught in the crossfire of serving two masters – the enterprise and its customers. Knowledge workers I speak with seek relief from work pressures exacerbated by the information overload they experience. They desire practical solutions attuned to the way they think and work rather than the way technologists think they work. They are ready to embrace solutions that make them much more effective and efficient contributors – as opposed to better record keepers. And, finally, they want help in servicing the customer because knowledge workers understand they are critical to the value chain. BPM would be well served by riding to their rescue.

As the demands amplify, due to extreme competition[iv], a crisis looms inside the enterprise. We feel it. We hear it. We know it's out there. We know it's on its way. The challenge is to take BPM principles and techniques and find a way to significantly improve support for complex knowledge-based activities to the benefit of both the knowledge worker and the enterprise.

By rigorously exploring the manner in which individuals and the organization work to reach decisions, we can expose the layers of complexity behind decision making in the enterprise. We can separate the granular requirements of individual decision making from the process requirements of enterprise decision making. From there, we can examine the critical working assumptions needed to drive decision-centric processes. These insights would then provide a path forward for using BPM to address these matters.

Decision Intensive Processes parse out a particular portion of that work world, establishing a scope that defines the problem as improvements in the effectiveness and efficiency of decision making processes in the enterprise. With this in mind, let's begin to explore the world of DIPs.

Knowing a DIP When You See One

Table 1 provides examples of critical business processes within several knowledge-based industries whose requirements are decision-centric. Note that the table includes a high level overview of tasks, roles, decisions, and outputs that comprise the process.

Table 1, Named Decision Intensive Processes

Industry **Named Process**	Role **Task** Key Decision(s) *Primary Output*		
Insurance **Underwriting**	Auditor **Submission Audit** Info Complete, Valid *Audit Review*	Actuary **Actuarial Analysis** Exposure is Manageable *Actuarial Report*	Underwriter **Policy Production** Premium and Attachments *Policy*
Life Sciences **Drug Study**	Clinician **Drug Study Planning** Design Of Study *Protocol*	Statistician **Study Statistical Design** Methods of Study Analysis *Statistical Plan*	Clinical Review Team **Study Analysis** Study Hypothesis Supported *Study Report*
Government **Security Clearance**	Investigator **Background Check** Investigation is Thorough *Investigative Report*	Polygraph Operator **Lie Detector Test** Subject Veracity *Polygraph Analysis*	Adjudicator **Clearance Determination** Type of Security Clearance *Adjudicative Report*

What do these processes have in common?

Each is a recurring, sophisticated, human-centric decision making activity that is central to the organizational value chain. Moreover, each requires numerous personnel to coordinate their decisions in a manner that generates value for the enterprise. You can see how the outcomes of these processes are critical for the organization's operational and/or financial viability.

Tasks are specialized according to the skill set required. During execution, careful analysis of and response to specific situational criteria are needed for effective decision making and optimal outcomes. It is also important to realize that many of the decisions made are often interdependent; i.e., decisions made at one point in the process can have profound impact at multiple other points in the process.

We can therefore define Decision Intensive Processes in general terms as follows:

> ***Decision Intensive Processes (DIPs) are repeated and repeatable business processes whose conduct and execution are heavily dependant upon knowledge workers in a variety of roles performing various decision making tasks that interconnect to drive critical organizational outcomes.***

Now that we can identify DIPs, let's look more closely at their underpinnings.

The Expert Decision Maker

By probing the act of decision making, we should gain insight into the workings of DIPs. To gain those insights, we consulted with the experts[v].

Experts as Decision Makers

In my explorations of expertise and decision making, I've come across some basic but often unspoken truths. They are captured in a joke you may have heard – about any "common" surgical procedure:

Q: What is the difference between minor surgery and major surgery?

A: Minor surgery happens to you; major surgery happens to me.

We laugh because there is nothing routine or minor about "me" facing a surgical procedure. But it is routine and minor for the doctor who repeatedly performs that procedure – so you should be fine.

Ask an expert whether a significant portion of the work he does has a repetitive, routine quality to it, and he'll agree. Experts note there are recognizable patterns in the work they do. However, they do indicate there is some manner of uniqueness in almost every scenario. Much of that uniqueness stems from new combinations of elements/factors they have witnessed previously and/or a new twist that influences the process. They point out that sometimes surprises do occur that require fresh perspectives, decision making, and creative action. Not unexpectedly, it's these scenarios that truly excite the expert.

Upon further probing, the expert confirms the majority effort is spent on core and routine elements that are common to every scenario. Remaining effort is spent on elements specific to the situation or moment. Occasionally an event is out of the ordinary. When that happens, the expert becomes creative, believing that wisdom and experience carries the day.

Does the above description hint that there may be particular methodologies and accompanying skills that comprise decision making processes? This question is pursued next.

The Skills of the Expert

What skills are fundamental to expertise?

If our focus is on the decisions experts make, there are two techniques favored by those who study expertise and its workings. The more powerful technique is that of pattern matcher. With this skill, decisions are made by drawing on the past scenario(s) that most closely resemble the current one. This technique requires possession of analytical pattern matching skills that are then

applied against memories of past scenarios. This is a very sophisticated skill that separates the expert from those still learning their craft.

The second, more commonly noted skill is the rules processor. With this skill, the expert applies logical principles to the current scenario in order to reach conclusions. Rules are developed by the expert, based on historical experience and are applied as the scenario unfolds.

When I talk to experts about how they reach their decisions, they confirm that they use the two skills discussed above. But they point out that there is much more taking place. They allude to much more fundamental skills that are broader in the scope of use. These experts speak of a holistic perspective to decision making that amounts to "making sense" of the situation. Let's trace one example.

A speech-language pathologist (SLP) assesses a child in a number of major categories of interest that affect speech and language functioning. Right away, the SLP seeks information on the current condition and state of each category of interest, quickly eliminating further inquiries in areas that seem normal. The SLP pursues remaining areas of concern, adding interpretations to existing information. For areas in question, rules are applied, comparisons are made to norms/averages, and patterns matched.

The work continues with the SLP listening to his or her intuitions before passing judgment on the problem(s) that might exist. This could lead the SLP to seek more information before a final decision on the problem is reached. Only then does the SLP reveal conclusions regarding the nature of the problem and recommendations for actions to be taken. If applicable, feedback from relevant parties is incorporated; final decisions are made and actions are implemented. All that remains is for the SLP to track the interventions to see if the results are in line with desired outcomes.

Is there a methodology hiding within the words of the previous two paragraphs? There is. Do those paragraphs suggest skills that the expert might possess? Yes, they do. What happens if I replace the domain specific language of speech and language in those paragraphs with domain specific language from another industry? For instance, do these descriptions of a decision making process hold true if, instead, we were discussing a doctor diagnosing a patient, an investigator interrogating a suspect, a scientist studying a drug, or an underwriter producing a policy? It sure does.

Let's focus on the main points to see what this decision making methodology looks like:

- Gather Information
- Analyze and Interpret
- Draw Conclusions/Reach Decisions
- Communicate Intentions
- Move into Action
- Track Results

Stepping back, you should see that the fundamental skill set possessed by the expert that causes this methodology to thrive is that of an *information processor.*

Characterized as an information processor, the expert becomes both a consumer and producer of information. In actively seeking and/or accepting available information as inputs, the expert is "consuming" information. Flowing from those inputs, the expert becomes a producer of informational outputs such as results of their analysis and interpretations, judgments, decisions, and recommendations for action. Specific information-based sub-skills are required for and within each of the elements of the methodology, but they all fall under the umbrella of the information processor.

The Enterprise as Decision Maker

Having revealed structural aspects of the expert as an individual decision maker, we now turn our attention to the enterprise. How is decision making responsibility divided and shared among many people in the enterprise? What are the structural implications of shared decision making?

Scaling Decision Making In the Enterprise

I am no longer surprised or disappointed when I discover there is no one person or document that can map a critical process in a knowledge-centric organization. Not that they are not trying. It's just that these large, complex decision-centric processes evolve naturally, making them a moving target.

You know the drill. A manager realizes the need to carve out a portion of an existing decision-centric activity because it would be best addressed by someone with a particular set of skills. A *knowledge worker* is brought in from elsewhere in the organization or hired to perform the newly established task. *Task specialization* has happened and a business process building block is spawned. DIPs evolve into a business process comprised of coordinated sets of tasks right under our noses.

But if DIP evolution seems easy, unfortunately, the execution is hard. Knowledge workers must quickly become experienced enough that tasks performed and decisions made by them within the process being served are relatively reliable and effective.

This is because each task in a DIP, and the knowledge worker who occupies it, are more than just part of a value chain; they work within a value network. The performance of one individual within one task can readily influence the conduct of many other tasks; some directly, most indirectly – all with an understanding that decisions made early in the DIP can lead to disastrous consequences later on – when the cost of error recovery is substantial.

The great complexity of a DIP arises from this intimate intertwining of decisions made by a knowledge worker with other decisions made across the enterprise. To bring this complexity under control, the execution of a DIP begs for the assurance that comes from a well structured environment. That structure includes setting expectations, establishing boundaries of responsibility, and oversight through the ongoing monitoring of work performed. But it also has to do with the flow of information, the medium by which information is moved around the enterprise, and the capabilities of the knowledge worker.

As I mentioned at the top of this section, I'm no longer surprised that organizations rarely have a road map for this kind of complexity.

Powering DIPs in the Enterprise

We call them knowledge workers. Their skill level runs the gamut from novice to apprentice, up through journeyman and expert. Interestingly, a DIP is best served if every type of knowledge worker performs his or her task in the manner of an expert. This does not mean we expect them to be as skilled as the expert. We just want them to approach their work with the techniques of an expert.

What skills and requirements can we reasonably demand of the knowledge worker, particularly the novice, so that every one of them mimics the expert to some degree? To answer, we reach back to my characterization of the expert as information processor. I posited an information processing methodology that differentiated activities and corresponding skills. A focus on information processing skills and methodology naturally aligns the knowledge worker with the expert.

In the case of an apprentice – provided the emphasis remains on core and routine decision making elements (such as information gathering) and any specific situational elements (such as those associated with analysis and interpretation) are properly monitored – we narrow the range of skills and requirements the knowledge worker must provide. And, with the right oversight from established experts as managers, the difference in experience in decision making can be attenuated, if not overcome.

By limiting scope of the decision making task to the level of information processing skills required and appropriate, the knowledge worker can at least mimic the approach of an expert. Furthermore, we can use our true experts to perform the most important work – reaching

decisions that align to a more complex outcome. It seems that DIPs already follow this recipe rather intuitively.

However, we still need a working description or explanation for this thing called knowledge. This remains the gaping hole in the discussion. Once we have a better definition for what knowledge is, then we can harness it on behalf of the knowledge worker. And we should have everything we need to really turn the power on and up within DIPs.

Summary

This article is the first in a series to explore business processes from the inside-out and the bottom-up; i.e., from the perspective of the knowledge worker and how his decisions connect up into the enterprise. Since these processes have everything to do with the nature of decision making, we classify them as a business process subcategory called *Decision Intensive Processes*. Decision Intensive Processes are recurring business processes conducted by knowledge workers who perform various interconnected decision making tasks that drive critical organizational outcomes.

We explored the structural foundation of DIPs by probing decision making as conducted by an expert (as an individual decision maker) and the enterprise (as a multi-person decision maker). Decision making does have a routine-ness to it with a core component across various scenarios that may arise. A second component attends to elements specific to the situation.

The routine within decision making suggests the existence of a methodology at the core of decision-centric activities. That methodology is driven by a skill set based on the expert acting as an information processor. In this mode, the expert seeks information as inputs, analyzes and interprets it in order to reach decisions, then turns around and outputs that information as a call to action.

DIPs evolve naturally and intuitively as managers carve out specialized tasks from existing business activities and assign them to knowledge workers with the required skill set. Knowledge workers then become part of a value network of great complexity wherein each decision made can affect decision making elsewhere in the process. Knowledge workers power the DIP, and information powers them. And the mechanics of DIP execution are well served by the structure that BPM offers.

Looking Ahead

The next article in this series, *Supporting the Practice: the Importance of Context in Decision Intensive Processes,* will explore how context is the key to domain specific knowledge and how context is critical to decision making. As noted, this is a gaping hole in this discussion, and we will look to fill it. I will introduce the concept of “the practice” as the performance of a decision making task driven by contextual considerations. I will also make the case that practice is process and what that means for our ability to differentiate and specialize tasks.

Currently planned for the third article is a transition to a working model for DIP design and execution. I’ll examine the six characteristics of DIPs: multiple tasks, multiple roles, practice driven, multi-level, interdependent and organic. I’ll share a comprehensive vision for an information-rich, inherently collaborative approach to organizational decision making that dramatically improves business velocity.

I will follow these first three with other articles that look at how BPMS and other technologies support various aspects of DIPs. Rather than looking at specific vendors and solutions, I will focus on how category features are utilized to optimize DIP performance.

References

[1] BPTrends Email Advisor: *Knowledge Workers, Experts, and the Analysis of Knowledge,* Paul Harmon, Nov 21, 2006.
[1] See recent BPTrend articles written by Fingar, Smith, Harrison-Broninski, or Kahn where they make the case for a greater focus on human-centric BPM.
[1] To address some of that gap in human-centric BPM, Fingar and Harrison-Broninski make the case for Human Interaction Management Systems in a recent series of BPTrend articles.
[1] Refer to Smith and Fingar books and subsequent BPTrends articles on Extreme Competition.
[1] Most of these observations follow from discussions with experts about their expertise and how they use it. I also draw on the literature on the nature of experts and expertise.

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