

Case Management: Combining Knowledge With Process

Executive Summary

Case Management is critical to the work of many organizations but is often intensely manual, paper-driven and plagued by delay and poor visibility. Primarily this is because Case Management requires supporting knowledge work, where many of the important steps take place in people's heads or through collaboration with colleagues, making knowledge intensive processes difficult to analyze and structure. Also, because cases are primarily driven by human participants reacting to changing context, cases do not follow a predetermined path defined in advance – they lack predictability, making them difficult to automate.

Case Management is important because knowledge workers are important. Between 25% and 40% of the workforce can be classified as knowledge workers today, and this proportion will increase. Knowledge workers also have a disproportionate impact on the success and growth of the organizations they work for. The most important processes in most organizations involve knowledge work – they add the most value and have the greatest impact on long-term success. But processes and the knowledge required to execute them have generally been badly integrated.

Various technologies have been proposed for supporting Case Management, including Customer Relationship Management and Content Management Systems. While these technologies play a role, they are not sufficient to address the key requirements of these types of processes. Specifically, they can't handle the requirement to initiate arbitrary new processes during the progress of a case based on the discretion of the human participants.

Case-oriented Business Process Management [BPM] is the ideal way to help knowledge workers become more effective in their work. Case-based BPM enables organizations to strike the appropriate balance between creating procedures for repetitive and mundane aspects of knowledge work while providing scope for the creative and discretionary elements. BPM-based Case Management can combine knowledge and process effectively, support the ad hoc and unpredictable nature of cases, and coordinate a range of other technologies to appropriately support knowledge intensive processes.

In this white paper we define case management in more detail, relate it to the broader subject of how knowledge workers do their jobs, and identify the characteristics that have made knowledge intensive processes difficult to automate in the past. We show how a Business Process Management approach with specific support for knowledge intensive processes provides the most appropriate solution to Case Management.

What is Case Management?

“For about fifteen years I’ve been doing research on business processes and how they can be improved. I’ve come to the conclusion that the most important processes for organizations today involve knowledge work. In the past, these haven’t really been the focus of most organizations – improving administrative and operational processes has been easier – but they must be in the future.”

Tom Davenport, “Thinking for a Living”ⁱ

Case Management is critical to the work of many organizations, and is a common approach to supporting knowledge intensive process. Case management, also known as case handling, describes the way organizations such as government agencies, banks, big legal firms and insurance providers handle complex customer and service interactions. When a customer initiates a request for some service, the set of interactions with that customer and other relevant participants from initiation to completion is known as the “case”. In the past, cases would have been managed using a manila folder of documents and records, with the folder moving through a department or organization from one in-tray to the next while the case was evaluated and progressed. Evaluation of the case would involve correspondence, phone calls, meetings and notes being appended to provide a record of the progress of the case. The staff working on the case, known as “case workers”, would be knowledgeable about their organization and how previous cases had been progressed, and would be empowered to use their judgment and discretion when deciding how some part of the current case should be handled. Cases might follow a general pattern, but each particular case would take its own unique path from initiation to resolution depending on the circumstances of the individual whose case was being handled.

Case management is often intensely manual, paper-driven, plagued by delay and poor visibility, with isolated parts of the process automated by legacy systems or spreadsheets. There are two main reasons why case management is so poorly supported. Firstly, it is inherently more difficult to automate than other processes because of the extent to which cases processes must support human knowledge, judgment and discretion to determine their outcome. It is harder to manage the complexity and unpredictability of a case than, say, automating payroll processing or credit card transaction processing. Secondly, the available technology simply hasn’t been able to support the requirements for dynamic-user driven changes to cases as they progress.

Let’s look at the characteristics of case management a little more closely before considering how it can be properly supported by technology.

Side-Bar: Defining Case Management

There are no universally accepted definitions available for case management. We define it as follows:

Case Management is the management of long-lived collaborative processes that coordinate knowledge, content, correspondence and resources to progress a case to achieve a particular goal; where the path of execution cannot be predetermined in advance of execution; where human judgment is required to determine how the end goal can be achieved; and where the state of a case can be altered by external out-of-band events.

Side-Bar: Examples of case management

Area	Case type
Government	Social welfare benefits applications Licensing and permits management Freedom of Information Enquiries Planning applications Industrial Health and Safety Enforcement Immigration applications Regulatory monitoring
Law enforcement	Firearms licensing Investigations Forensics management
Financial Services	Corporate customer on-boarding Regulatory compliance management Insurance claim processing Trade Settlement exception management
Telecommunications	Customer provisioning Fault reporting and resolution Billing issue resolution

Characteristics of case management

Case management scenarios share a lot of common characteristics. Case workers need to manage a complex set of steps from the start of a case through to its completion, usually involving interaction with others in their organization and with external agencies, and requiring the generation of correspondence, documents and records. The key characteristics of case management include:

- **Knowledge-intensive:** Typically case management processes require the intervention of skilled and knowledgeable personnel. Staff acquire their knowledge through their experience of working on similar cases and through collaboration with more experienced colleagues, becoming thoroughly familiar with the tacit and explicit rules governing how cases should be managed. These staff have to deal with issues that can be ambiguous and uncertain and that require judgment and creativity. Managing knowledge so it stays within the organization and is passed quickly to new members of staff is a challenge.
- **Variability:** While a particular type of case will share a general structure (e.g. handling benefits applications), it is not possible to predetermine the path that a particular instance of a case will takeⁱⁱ. A case can change in unpredictable, dynamic and ad hoc ways as it is progressed through an organization. Certain elements may be fixed (e.g. the end-to-end duration for completing a case may be set to 18 months, or a fixed budget may be allocated to each case) but there can be considerable variation in how steps are executed, based on the particular circumstances of the case.
- **Long Running:** cases can run for months or years, and are generally much longer running than the shorter interaction cycles handled by standard customer relationship management (CRM) systems. Because a case is long running, it changes hands over time, different people work on different aspects and no single individual has an accurate

- view of the case as a whole. This drives the need for a supporting case management system that can provide a single consolidated picture of the case.
- **Information Complexity:** Case management almost always entails the collection and presentation of a diverse set of documents and records. Emails, meeting notes, case documents and correspondence related to a case must be easily accessible to the appropriate case worker at the right time. This is often difficult for case managers to organize and manage efficiently, with the danger that an important record, note or file will be unavailable, lost or overlooked when it is needed. Retrieving the correct information required at a particular decision point usually depends on the knowledge of the case worker and an adequate physical filing system.
 - **Collaboration and Coordination:** case workers usually need to co-ordinate interviews and meetings among interested parties, e.g., scheduling an interview with an applicant, with other staff in the organization, with legal representatives. Many cases require a team-based approach, with different specialists working on different aspects of a case or acting as consultants to their colleagues. These team members need to be able to access case information and discuss it with each other. Collaboration is particularly important in knowledge-based case management because workers rely on each other's advice and experience when making decisions on a case.
 - **Multiple Participants, Multiple Roles:** There are often a range of involved parties, either directly or indirectly related to a case, who play different roles during the lifetime of the case – e.g. applicant, witness, claimant, injured party, appellant etc. There can also be a large range of staff roles required to complete a case end-to-end. And case workers can fulfill different roles in different types of cases.
 - **Cases Can Be Interrelated:** The outcome of separate cases may have an impact on each other. For example, an application for citizenship by an individual may be affected by the success or failure of an application by a spouse or immediate relative. Cases can be explicitly linked or they may be linked by inference and conducted with this inferred link in mind.
 - **Critical Nature of Timescales:** While cases may have great variability in how they are completed, very often there are inflexible requirements for end-to-end timescales, driven by legislation or Service Level Agreements.
 - **External Events Affect cases:** external, out-of-band events and intervention can change the state of a running case, e.g., a phone call from a lawyer or the unscheduled arrival of compliance documentation.
 - **Difficulty in Gaining Visibility of Case Progress:** This is a common characteristic of case management as it is implemented today, although it is not an inherent characteristic. While case workers may have a good understanding of how they are progressing individual cases, it is often difficult to monitor progress when work has been passed to colleagues within their own unit or to an external department. At a higher level, managers usually have poor visibility of how long it takes to progress a case on average, how much a case costs to process, and what the expected completion time is for a particular case. It may also be difficult to obtain information on which cases are stalled waiting for an external communication and which steps in a case are repeatedly causing bottlenecks. The result is that processing of cases is often serialized, because to run them in parallel, while more efficient, is just too difficult for many organizations to manage.
 - **Strong Reporting Requirements:** There is usually a significant requirement to report on and analyze information derived from case handling, both at operational and management levels, for example workload analysis of cases by stage, by individual and by department and case performance versus target. Managers want gain insight into operational performance and quickly identify exceptions.

- **History:** Every action performed, every decision taken and every piece of correspondence received has to be tracked, not just for audit purposes, but also to provide guidance for future similar cases. Case workers need access to this history when making decisions, while auditors need the history to ensure policies are being adhered to. The case history is the organization's defense mechanism against any allegations of failure to perform, particularly in cases which have high cost or personal impact.
- **Security:** There is a requirement to provide fine-grained control over who has access to particular information and functionality. In certain environments, these security requirements assume particular significance e.g. policing, health care and child protection.
- **Isolated Pockets of Automation:** This is a characteristic of case management as it is generally implemented today, rather than an inherent characteristic. Case management is usually only partly automated and there is disjoint between those pockets of automation. Legacy systems automate slices of the processes, but the end-to-end management of a case still relies too heavily on paper documentation, physical folders, spreadsheets and email.

While this list of characteristics is not exhaustive, it captures the essential aspects of managing cases. But what are the practical implications? Why should people care about the characteristics of cases or the issues raised when trying to automate them?

Box: When Case Management Goes Wrong: 44 bereavement contacts with government

A 2005 UK Cabinet Office Report presented an example of what one typical family had to go through following a bereavement. Unfortunately, a member of the family died in a road traffic accident in September 2004. Following the accident the family had a total of 44 contacts with government over 180 days trying to make the necessary arrangements.

Upon his death the individual and his widow were in receipt of a retirement pension, disability living allowance, council tax benefit and housing benefit. The majority of the 44 contacts concerned amending these benefits and nearly half involved the family having to contact government regarding the same issue rather than government contacting them.

The family encountered many examples of a disjointed public service including the widow receiving unexplained payments and two separate letters on the same day providing conflicting information about entitlements and the family having to contact the local authority multiple times regarding the life insurance payment before it was taken into account for housing benefit purposes. After 180 days, the Passport Agency still had not contacted the family to collect the passport and issues around housing benefit had not been resolved."

See http://www.hm-treasury.gov.uk/media/4/F/pbr06_varney_review.pdf

Why is Case Management important?

Case Management is important because knowledge workers are important. Case Management is the most common approach to supporting knowledge workers with technology, but it is not done well. First, we'll discuss just why knowledge workers are so important.

Tom Davenport has defined knowledge workers as "people whose primary job is to do something with knowledge: to create it, distribute it, apply it."ⁱⁱⁱ

Knowledge workers think for a living. They solve problems, they understand and meet the needs of customers, they make decisions, and they collaborate and communicate with other people in the course of doing their work.^{iv}

In the late 1950s and 1960s the economist Fritz Malchup first tried to formalize the size of the knowledge sector of the economy, suggesting it was growing two times faster than other sectors^v, and management author Peter Drucker highlighted the growing importance of knowledge workers and their productivity.^{vi} More recently, research in the US, Canada and the UK suggests that between 25% and 40% of the workforce can be classified as knowledge workers, and that this proportion will increase^{vii}.

Knowledge workers are important not just because they make up a growing proportion of the workforce, but also because of their disproportionate impact on the companies and economies they work in.

Even if they're not a majority of all workers, they have the most influence on their economies. They are paid the most, they add the most economic value and they are the greatest determinant of the worth of their companies. Companies with a high proportion of knowledge workers – let's call them knowledge intensive – are the fastest growing and most successful in the United States and other leading economies, and have generated most of these economies' growth in the past couple of decades.^{viii}

Knowledge workers tend to be closely aligned with the organization's growth prospects. Knowledge workers in management roles come up with new strategies. Knowledge workers in R&D and engineering create new products. Knowledge workers in marketing package up products and services in ways that appeal to customers. Without knowledge workers there would be no new products and services, and no growth.^{ix}

Over the past hundred years the automation of work focused first on automating manufacturing, then automating clerical work with the introduction of computers at the second half of the twentieth century, through to automating knowledge-centric work today. For much of the past four decades computer automation was directed at areas that were clearly defined and fairly predictable at "design-time", mainly operational and administrative processes. Examples include bank automation, airline booking automation and manufacturing production automation. These kinds of processes could be complex, but the complexities could be analyzed, anticipated and accommodated at the design phase. When we went to execute these processes, the "system" dictated most of the sequence of events to the human participants, based on logic embedded in software. This kind of automation has meant that old-fashioned clerical roles are largely disappearing. However, as these roles have reduced, there has been an increase in roles that demand greater skills and knowledge. But despite the growth in the number of knowledge workers and their importance to organizational success, there has been limited effort made to improve knowledge centric processes:

Process improvement has mostly been for other workers: transactional workers, manufacturing workers, people in call centers. All the serious approaches to improving work have largely escaped knowledge work.^x

A recent report by McKinsey reinforces this message

Companies have been automating or offshoring an increasing proportion of their production and manufacturing (transformational) activities and their clerical or simple rules-based (transactional) activities. As a result, a growing proportion of the labor force in developed economies engages primarily in work that involves negotiations and conversations, knowledge, judgment and ad hoc collaboration – tacit interactions, as we call them. By 2015 we expect employment in jobs primarily involving such interactions to account for about 44 per cent of total US employment, up from 40 percent today. Europe and Japan will experience similar changes in the composition of their workforces. *The application of technology has reduced differences among the productivity of transformational and transactional employees, but huge inconsistencies persist in the productivity of high-value tacit ones.* [our italics]^{xi}

So, knowledge workers are the most important and fastest growing section of the workforce, but the processes they use in their work are not well supported by technology; and generally they haven't been the focus of systematic process improvement initiatives.

Box: Tom Davenport on Managing Knowledge Workers

- Knowledge workers differ from other kinds of workers in their autonomy, motivations and attitudes.
- Knowledge work tends to be unstructured. Specifying a detailed flow of work is sometimes possible, but is probably not the best way to improve a knowledge work process.
- Knowledge work often needs to be observed in some detail and at some length before it can be truly understood.
- Knowledge workers are usually intelligent, so be careful about assuming that a particular work task is unnecessary or that a work process can be improved upon easily.
- Commitment matters to knowledge work. Don't do anything to damage the knowledge worker's commitment to the job and the organization.

From "Thinking for a Living", Tom Davenport

The Importance of Combining Process and Knowledge

It is self-evident that there should be good linkage between knowledge-centric processes and the underlying knowledge needed to carry out those processes.^{xii} However, process and knowledge are generally *not* well integrated. In a 2005 article, L.Russell Records of CSC Consulting discussed the parallel evolution of business process reengineering and Knowledge Management, highlighting the lack of integration between the two:

There was (and still is) a general lack of understanding of how valuable the fusion of processes and knowledge can be. The thought of actually taking the distilled knowledge and making it easily available to people executing the process was somehow overlooked. Employees would only stop to access the available knowledge base when the process execution came to a screeching halt due to an inability on the part of the employee to continue. Many times this would involve looking up information in an offline source like a procedures handbook or calling a friend who might know the answer.^{xiii}

It's worth providing a little historical background to this issue. Paul Harmon, editor of BPTrends, described in a 2006 article how approaches from cognitive psychology and computer science were used in the 1980s to capture and embed knowledge in software systems (known as "expert systems")^{xiv}. According to Harmon:

Ultimately expert systems have not proven very viable. It turns out that human expertise – if it's worthy of the name – needs to be constantly maintained. Human experts attend conferences, read books and research papers, and constantly interact with peers while trying to solve hard problems. All this leads to their reformulating their knowledge. It turns out that it is expensive to capture human knowledge from an expert system, but it is much more expensive to maintain that knowledge.

The next major attempt to focus on the use of knowledge in work was the Knowledge Management movement, which gained momentum in the late 1990s. Knowledge Management aimed to capture knowledge effectively, categorize it and then make that knowledge available across an organization.

For the most part, it wasn't particularly successful, because we didn't look closely at how knowledge workers did their work.... Most organizations simply created one big repository for all knowledge and all workers. The only way to get people to use knowledge on the job is to understand how they do their jobs and then figure out some way to inject knowledge into the course of their day-to-day work, not make it a separate thing you have to consult

when you need knowledge. ... The best way is to use technology to bake the knowledge into the job.^{xv}

This inability to access the right information at the point in a process when it is needed is a problem:

Process execution normally stops when someone has to retrieve knowledge that has not been provisioned for them to use. When this occurs in a customer-facing process, the cost to execute the process skyrockets.^{xvi}

While it seems obvious that integrating knowledge at the correct points in a process is a good idea, what has this got to do with Case Management? Singularity believes that an effective Case Management solution based on Business Process Management technology provides the best mechanism for supporting the appropriate creation, dissemination and retrieval of knowledge for knowledge workers within a process. The goal is to provide the information the worker needs at the point in a process when he needs it, rather than force him to go searching for it when he hits a problem. We also believe the supporting technology should help capture useful, shareable knowledge from workers so it can be distributed to others doing the same kind of work. L. Russell Records states that the goal

“...is to diligently and selectively move the knowledge into the IT infrastructure so that it can be used to improve the execution of key business processes.”^{xvii}

We would emphasize the word “selectively” here. It should not be a goal, stated or implicit, to try to move all knowledge out of workers heads and into the IT infrastructure. As Paul Harmon pointed out, knowledge is constantly being created, knowledge workers are constantly learning, so only certain elements of the knowledge relevant to a particular type of work can be transferred to automated systems. But we should provide tools that let the knowledge worker capture new insights and information so that it can be reused by themselves and their colleagues at appropriate steps in a process, and that gather knowledge about how processes are performed for analysis and ongoing improvement of knowledge processes.

The Challenges of Automating Case Management

The characteristics of Case Management we outlined earlier indicate where the challenges lie when trying to more fully automate this style of work. As with the automation of any business processes, the technology has to support “exception handling, collaboration, decision making, unstructured information, negotiations and paper flows”^{xviii}. But the fundamental challenge in automating case management is using the technology to support the unpredictable ways cases progress and people work in practice. Traditional automation assumes that a sequence or pattern can be determined in advance by careful initial analysis and catered for by good design. More formally, it assumes that the logical flows can be understood *a priori*. As noted by van der Aalst et al^{xix}, in a traditional approach the designer has to specify what is permitted. Any routing that is not specified at design time will not be supported by the system at runtime. However, when seeking to automate cases, there is no predetermined sequence, and new tasks and processes can be added at any point during the life cycle of the case as the need for them arises. The emphasis must be on supporting the ad hoc nature of cases. As Lucy Suchman puts it

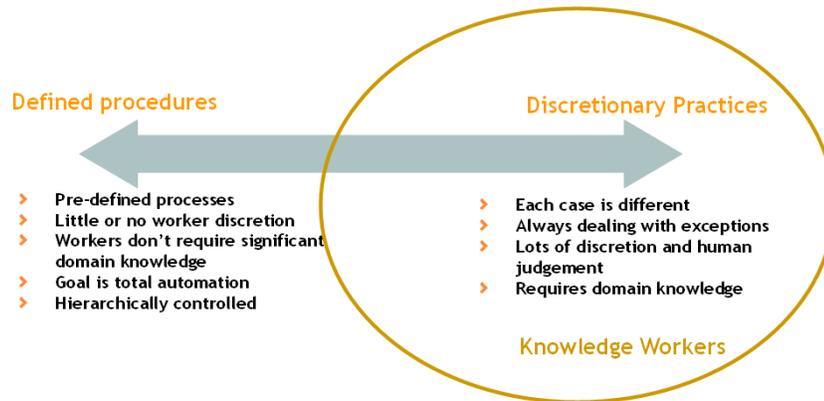
“The trick is to introduce bits of automation that will fit in to the work and do useful things, and then make it possible for people to work with those bits of automation embedded in the systems while leaving them the discretionary space to exercise the kind of judgment they need to exercise to really get the work done”^{xx}

The challenges specific to automating Case Management include:

- **Striking a balance between Practice and Procedure:**

Almost any job today has both clearly defined, predictable elements and less well defined, more ambiguous aspects where workers exercise their judgment. Different types of job, and the activities within a particular job, can be thought of as a spectrum

running from "well defined procedure" to loosely defined "discretionary practice". Someone working in a call center generally doesn't exercise great discretion in how they carry out their job, while a senior investment analyst probably does.



Source: adapted from Derek Miers^{xxi} and Paul Harmon^{xxii}

There is a danger of aiming to fully proceduralize processes when reengineering knowledge work, ignoring the "Practice" side of the spectrum. However, this is counter productive, because when a case occurs that doesn't match the rules prescribed in the procedure, workers are either brought to a halt or forced to create an unofficial workaround.^{xxiii} A careful balance must be maintained between prescribing defined procedures for fully understood and repeatable aspects of work, while respecting the parts of work that should be left to the discretion of knowledge workers.

Every effort to change how work is done needs a dose of both process – the design for how work is to be done – and practice, an understanding of how individual workers respond to the real world of work and accomplish their assigned tasks.^{xxiv}

It should be a goal that as particular workers become more experienced, they will be able to formalized and standardize aspects of what they do, and these standardized procedures can then be made available for use by colleagues.^{xxv}

- **Capturing Implicit Rules and Tacit Knowledge:** This challenge is related to the point made about Practice versus Procedure. Many case management processes will never have been previously automated. They rely on paper forms and tacit and implicit rules governing how cases should be managed in addition to documented and explicit policies and procedures. Examples of implicit rules will include how staff cope with particular exceptions, how they make decisions at particular stages of a case and how they deal with unstructured information. The challenge here is to discover these implicit rules and tacit knowledge and, where appropriate, try to support their automation, while leaving room for those steps and decisions that should continue to depend on individual discretion.
- **Formalizing Experience – Supporting Learning:** A good Case Management solution should help an organization learn from previous cases. This learning could be exhibited in the definition of new processes, new procedures, better online help etc., where lessons learned by knowledge workers during a previous case were quickly applied to process definitions to improve them. We use the phrase "formalizing experience" to describe this process of changing a practice into an automated step where appropriate, or supporting some other action that will assist in the processing of future cases.

There is a related area of research, called Case Based Reasoning (CBR), which has some obvious applicability to Case Management. Case Based Reasoning is the process of solving new problems based on the solution of similar past problems: it's based on two

tenets, “similar problems have similar solutions. Consequently, solutions for similar prior problems are a useful starting point for new problem-solving” and “the types of problems an agent encounters tend to recur. Consequently, future problems are likely to be similar to current problems”^{xxvi}. CBR consists of four steps – look at a given case or problem and try to think of a previous case or cases it might match; consider how the solution to the previous case could be applied to the current case; test the solution on the existing case and revise it if necessary; then record the new case, and the solution that eventually worked, for future reference.

- **Supporting Ad Hoc Change:** It is not possible to fully analyze and define at design time how a case will actually unfold at “runtime”. While the overall pattern of a typical case may be known, any case management system must allow for entirely new and unpredictable process paths being required at execution time. This is due to the nature of cases, where a range of outcomes may arise at each stage in the case, unpredictable at design time, and these outcomes then determine the next stage or stages. Also because cases are long-running, change may be introduced into the policies governing how cases are handled while previous cases are being processed. For example, mid way through the execution of an application for social welfare benefits, an entirely new set of steps may be initiated to comply with new procedural guidelines, or to cope with an unplanned external event such as the completion of a related case.
- **Involving Participants in the Design of Knowledge Processes:** the challenge here is to let knowledge workers influence the design of those processes they participate in, helping them make changes to processes or innovating new ones. Any solution needs to support fast, easy change initiated by a worker.
- **Supporting Collaboration :** Collaboration is a key requirement, but it is not simply a matter of enabling instant messaging or document sharing. Case workers need to share everything related to a case, including history, discussions, correspondence and previous decisions. The collaboration support for case management must ensure that the correct information is made available to team members at the correct time, without losing the context or current state of progress of the case. This requires a “smart” system that knows who needs what when. Conversely, it is important that irrelevant information is not provided at the wrong time, and that confidential information is not made available to inappropriate recipients.
- **Supporting Decisions:** Case workers are the key decision makers in determining how a case will progress, supported where appropriate by automated rules. Automation of cases must recognize that control will continue to reside with human case participants, rather than seeking to encapsulate everything in an increasingly complex rule-base.
- **Effectively Coordinating Participants:** related to the point above, effective case management requires that work is routed to participants at the appropriate time and in the appropriate sequence, given the history of the case to date. This coordination requires sophisticated workflow routing, synchronization of process flows at various points, ensuring overall milestones are monitored and met, and ensuring that delays are identified and exceptions raised where necessary.
- **Managing Complexity:** Information and data has to be organized and presented to all case workers in a useful way so they do not become overwhelmed or confused by the various pieces of documentation, records and notes related to a case. The interface used by case workers to interact with automating systems is a key determinant of the success of any automation.
- **Managing Artifacts:** Beyond the presentation of case information to the user, there is a need to effectively store, manage and retrieve information related to a case. Case history and associated records may need to be retained for specific periods, as a result of legislation or organizational policy. Content may be structured or unstructured, and may reside on multiple supporting systems such as databases, content management systems and electronic record management systems. Any case management solution must manage this content efficiently and effectively.

- **Integrating Disparate Systems:** While key aspects of case management are poorly automated, there are almost always some important legacy systems in use at an organization that will be part of any solution. Effective case management requires the smooth integration of these existing systems into any future solution.

Box : The benefits of Effective Case Management

- **Improved Performance and Productivity** – knowledge centric processes are streamlined, with mundane and repetitive steps automated and tasks such as scheduling of meetings or milestone monitoring handled by the system. This leads to measurable improvements in case completion times, customer response times and case effort and cost.
- **Reduction in Paper-intensive Tasks** – effective case management frees case workers and managers from managing large amounts of paper forms and records
- **Greater Visibility** – a good case management solution will provide insight into how many cases are being processed, what stage each case is at, and aggregated information such as the average cost per case and average time to completion. Case Workers are notified of problems in advance of their occurrence, and can easily monitor overall case progress across their organization
- **Greater Consistency** – the predictable and repeatable elements in case handling can be encapsulated in standard processes, allowing for greater consistency. Errors are reduced through a reduction in manual records, data entry and hand-offs
- **Scalability** – with improved performance, consistency and visibility comes the added benefit of scalability. Managers can confidently predict how many cases they can process with a given set of resources, and scale up to meet greater demands as required.
- **Capturing and Sharing Process Knowledge** – important aspects of a case type can be modeled and shared, avoiding knowledge loss when staff change and facilitating the training of new staff. Lessons learned from previous cases can be captured and made available for subsequent reuse
- **Flexibility** – good case management allows for adaptation during the execution of a case, enabling case workers to modify their approach as required by current circumstances, rather than being locked-in to a predefined path set by the technology
- **Better Coordination of Existing Systems** – today humans acts as the key method of system integration for many knowledge intensive processes, through copying and pasting between applications and transferring documents manually to colleagues. Good case management joins up and coordinates the various supporting systems, reducing the need for repeated data entry and manual hand-offs
- **Agility** – BPM-based case management enables workers to have a real-time view of current case status and react quickly to important internal and external events e.g. a change in regulations.
- **More Effective Collaboration** – case workers have a better view of the overall progress of a case, and can easily share information or initiate discussions on particular stages in a case.

BPM-based Case Management

We've discussed the characteristics and the challenges to be overcome when automating case management. The question then turns to the most appropriate technology to use to support case management. Until recently the main approaches advocated have been:

- Custom-built applications
- Customer Relationship Management (CRM) systems
- Electronic Document and Record Management (EDRMS) systems

None of these approaches are fully appropriate, for the following reasons.

- Firstly, developing a custom-built application will make it difficult to support the ad hoc and dynamic nature of case management. Developing a custom application assumes that all the possible paths for the execution of a case can be identified up-front or catered through sufficient analysis and careful design. But the nature of cases means this will never be true – there will always be significant exceptions to whatever paths are identified at the design stage. Another objection to the development of a custom application is that the business logic will be buried in software code and so will be inaccessible to the case workers who work with the system on a day-to-day basis, making it difficult to maintain and change. Finally, this approach is inadvisable for the same reasons that gave rise to the birth of commercial software products – where possible, it is almost always preferable to select a commercial off-the-shelf (COTS) product, with the benefits this provides in terms of cost, reliability, and pre-built integration points to popular systems and general support.
- Customer Relationship Management (CRM) systems are also proposed as a way to automate case management. However, CRM systems are generally optimized for short-lived, high-volume customer interactions, not cases that can last for months or years. They have usually focused on interactions with a single client, not in the management of multiple external parties that potentially belong to several organizations. They also suffer from the problem cited for custom applications, in that the process logic governing the management of the case is buried within the application and so cannot be easily manipulated and changed by case workers and managers. Most importantly, they provide little or no support for ongoing ad-hoc and dynamic process change during the execution of a case.^{xxvii} While CRM systems are likely to be an important element in a case management solution (e.g. for storing customer data), they are not sufficient to meet the full range of requirements.
- Lastly, while Electronic Document and Record Management Systems (EDRMS) will form a crucial element in most case management solutions, as they are needed to store, manage and retrieve content related to a case, they too have minimal support for complex interactions and long-lived case management. These systems are optimized to manage the storage and retrieval of records, not the management of dynamic processes and complex human interactions over long periods of time. Frequently case content will be distributed across multiple data stores, so a single EDRMS solution may not even be appropriate for the content management aspects of case automation.

Given these objections, what is the alternative? Case management is about the successful coordination of a number of different technologies in order to provide a supporting environment that enables knowledge workers to achieve an outcome. Successful case management, when all of the tools and technologies are correctly aligned, enables efficient working. The focus on supporting knowledge workers is critical – removing many of the mundane tasks such as tracking progress, managing and generating the required artifacts, guiding them through critical aspects of

the process. Equally there is a need to support appropriate decision making by knowledge workers, as well as a need to support the impact of external events on cases.

Case-oriented Business Process Management (BPM) represents the best approach to automation of case management. It meets the requirement of orchestrating disparate technologies, while also supporting the modeling and definition of the processes that drive the case. It can leverage the capabilities of technologies such as CRM and EDRMS, while also supporting the need for dynamic change and ongoing adaptability. A BPM system that supports case management can integrate with technologies such as content management systems, databases and CRM systems, and present one interface to the user, enabling case workers to gain a single unified view of a particular case. A case-centric BPM solution can provide support for well-defined processes that interact with each other in a range of ways determined during the execution of the case, not at design time.

Case-oriented BPM can overcome the limitations of the other proposed technologies through its support for:

- Explicit graphical modeling of business processes, so that these are visible to and can be managed and changed by case workers
- Execution of complex processes that interact with and coordinate multiple systems
- Support for frequent, rapid and dynamic change to cases
- Support for knowledge capture and knowledge sharing
- Support for team collaboration
- Integration to multiple supporting content repositories

Conclusion

Through the course of this white paper we defined Case Management and its characteristics, and highlighted its link to knowledge workers. We emphasized the growing importance of knowledge workers and the current poor support for knowledge work automation. We also discussed the challenges in supporting this kind of knowledge work. We considered three competing approaches to supporting Case Management – the “grow your own” self-build option, or else using a Document Management or CRM system to meet the requirements. However, none of these approaches are adequate. Case-oriented Business Process Management [BPM] is the ideal way to support knowledge workers as they strive to become better and more effective in their work. BPM enables organizations to strike the appropriate balance between proceduralising repetitive and mundane aspects of knowledge work while providing scope for the creative and discretionary elements. BPM-based Case Management combines knowledge and process effectively, supporting the ad hoc and unpredictable nature of cases, and coordinates a range of other technologies to appropriately support knowledge-intensive processes.

Fundamentally, we believe Case Management is important because Knowledge Work is important. As we noted, the most important processes in most organizations involve knowledge work; they add the most value and have the greatest impact on long-term success. But processes and the knowledge required to execute them have generally been badly integrated, which means that knowledge work has been poorly supported by technology. We have tried to address this issue with Singularity's unique case-oriented Business Process Management.

References

- ⁱ Davenport, Tom, "Thinking for a Living", Harvard Business School Press, 2005
- Van der Aalst, Wil M.P., Weske, M., Grünbauer, D., "Case Handling: a new paradigm for business process support", Eindhoven, 2004, p1
- "Unlike workflow management, which uses predefined process control structures to determine what should be done during a workflow process, case handling focuses on what *can* be done to achieve a business goal. In case handling, the knowledge worker in charge of a particular case actively decides on how the goal of that case is reached, and the role of a case handling system is assisting rather than guiding her in doing so.
- ⁱⁱⁱ Quoted in Alter, Allen, "Knowledge workers need better management", CIOInsight.com, 5 Aug 2008
- ^{iv} Davenport, Tom, "Thinking for a Living", Harvard Business School Press, 2005, p10
- ^v Malchup, Fritz, "The Production and Distribution of Knowledge in the United States", Princeton University Press, 1958
- ^{vi} "To make knowledge work productive will be the great management task of this century, just as to make manual work productive was the great management task of the last century", from Peter Drucker, "The age of Discontinuity", New York, Harper & Row, 1969,
- "The productivity of knowledge and knowledge workers will not be the only competitive factor in the world economy. It is, however, likely to become the decisive factor, at least for most industries in the developed countries", from Peter Drucker, "The future that has already happened", Harvard Business Review, Sep – Oct 1997
- Both quoted by Tom Davenport in "Thinking for a living", page 8
- ^{vii} Davenport, Tom, "Thinking for a Living", Harvard Business School Press, 2005, p5
- ^{viii} Davenport, Tom, "Thinking for a Living", Harvard Business School Press, 2005, p4
- ^{ix} Davenport, Tom, "Thinking for a Living", Harvard Business School Press, 2005, p7
- ^x Quoted in Alter, Allen, "Knowledge workers need better management", CIOInsight.com, 5 Aug 2008
- ^{xi} "The McKinsey Quarterly- Eight business technology trends to watch", December 2007
- ^{xii} For example, "integrating knowledge management into business processes" was selected as the most important issue of knowledge management in a 2002 survey of academics engaged in KM research – see First Global Delphi Study, "The Future of Knowledge Management", Humboldt University, Berlin, March 2002
- ^{xiii} Records, L. Russell, "The Fusion of Process and Knowledge Management", BPTrends, September 2005
- ^{xiv} Harmon, Paul, Review of "Working Minds: A practitioner's guide to cognitive task analysis" by Beth Crandall, Gary Klein and Robert R. Hoffman, BPTrends, October 2006
- ^{xv} Quoted in Alter, Allen, "Knowledge workers need better management", CIOInsight.com, 5 Aug 2008
- ^{xvi} Records, L. Russell, "The Fusion of Process and Knowledge Management", BPTrends, September 2005
- ^{xvii} Records, L. Russell, "The Fusion of Process and Knowledge Management", BPTrends, September 2005
- ^{xviii} "BPM: A change from business as usual", Gartner, Janelle Hill, February 2007
- ^{xix} "The Case Handling Case", Reijers, Rigter and Van der Aalst, Eindhoven University
- ^{xx} Quoted in "Process Innovation and Corporate Agility: balancing efficiency and adaptability in a knowledge centric world", Derek Miers, BPMFocus, 2006, p6
- ^{xxi} Miers, Derek, "Process Innovation and Corporate Agility: balancing efficiency and adaptability in a knowledge centric world", BPMFocus, 2006, p3
- ^{xxii} Harmon, Paul, Review of "Working Minds: A practitioner's guide to cognitive task analysis" by Beth Crandall, Gary Klein and Robert R. Hoffman, BPTrends, October 2006, Fig. 1, p3
- ^{xxiii} In a paper by Brown and Duguid, cited by Davenport and others, the authors studied the work of a group of IT support technicians, finding that the formally defined procedures imposed on them were counterproductive, forcing staff to carry out strenuous workarounds in order to solve problems while being seen to comply with company rules – see Brown, John Seely, Duguid, Paul, "Organizational Learning and Communities of Practice", The Institute of Management Sciences, 1991
- ^{xxiv} Davenport, Tom, "Thinking for a Living", Harvard Business School Press, 2005, p74
- ^{xxv} Miers, Derek, "Process Innovation and Corporate Agility: balancing efficiency and adaptability in a knowledge centric world", BPMFocus, 2006, p3
- "When someone starts in a new position, they tend to follow the rules. After 3 months, they might have a good feel for those rules that are important and those rules that are safe to ignore or break. After 3 years of experience, they may even help establish the rules that govern their position"
- ^{xxvi} Leake, David, "Case Based Reasoning in Context: the Present and the Future", AAI Press/MIT Press, 1996, p2
- ^{xxvii} Miers, Derek, "Business Processes and Customers – Difficult domains to integrate", BPMFocus, 2007