A Very Simple Example Workflow Application

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Introduction

One of the best ways of coming to understand Workflow Software is to examine it from the end-user's perspective. What does it look like as an application on the workstations of the users, and how do they interact with it?

We will invent a sample workflow, a deliberately “low-tech” application, and we will illustrate a few of the screens to show what some parts of the application might look like. Note that this sample is not based on any system the author has worked on, so it is not intended as a demonstration of how to design for a specific niche.

Our goals in this discussion are as follows:

- To provide an easy-to-follow example of a workflow application, especially for readers who are not very familiar with them.
- To illustrate by example how a business process that involves an extended period of time and a number of people to complete, can be automated by software.
- To illustrate by example the ways in which process activities can weave through and have key touch points in the software application, even though a great deal of activity occurs outside the application context.
- To show some of the benefits the software brings to the process.
- To show that these benefits are achieved through relatively simple means.
- To summarize the basic features of workflow that this example points out.

Application Basics

We will refer to the “screens” in the application. What we are referring to are the *application windows* that a are open on a user’s computer monitor when the application runs. There are two kinds of screens we illustrate in our sample:

1. <u>The “To-do” List.</u> This is a list of objects ready for work by the user in row and column format. The user will be able to scroll the list if it is long and sort it, perhaps by clicking on the headings at the top. Each *row* in the list represents one workflow task in process. Summary information in the columns allows the user to identify the tasks quickly. A to-do list is tailored for each user. Different users see different lists, though in the full application, users can view many lists, some personalized and some common. When the user mouse clicks anywhere on a row in the list, the

second kind of screen is opened up, the detail screen.

2. The Detail Screen. This screen shows *all* information to date about an individual task in process. In addition, there are edit boxes, blanks to fill in, pull-down lists for selecting choices, and buttons to click in order to bring up more detail, save work in progress, or move the process along. This is the working screen where users can see was has already been done, and enter the results of *their* work. Sometimes the detail screen is referred to as a *form*, because it functions like a form to be filled in. It can also be referred to as a *data entry screen*, because it is where the user enters information. In a full application the detail "screen" may in fact require multiple windows if there is a lot of information and/or functionality. A detail screen can also be brought up with blank fields to create a "new" task. Detail screens generally get more complicated as a workflow progresses since information is accruing.

In a complete application there may be other kinds of screens as well. However, the two described above are very central to most workflows. The look-and-feel and implementation vary, but the idea is essentially the same, namely: navigating from a space where the user can quickly see, sort, and select tasks to work on, to a space where the user sees everything needed to work on one selected task. This way of navigating should be very familiar to the reader from many software products. Consider email, for example. When you open the inbox or another folder you see a list of all the emails in the folder, one per row, showing summary information in columns allowing an email to be identified quickly. You click on a row, and the full email opens. You can also create a new email, i.e., bring up a blank data entry screen.

We are also all familiar with the personalized list or view. For example, when we go to Amazon.com and look at our shopping cart or wish list, or go to Ebay.com and look at our auctions in progress or watch list, we are interfacing with what is essentially a massive software application. Yet we get lists or views personalized to us. What's more, normally, we can't see other people's lists, without their permission, nor can others see our lists.

Example Application: The Coach Broker

We have an imaginary small company that brokers personal coaches to meet specialized needs of their clients in and around London. The example application will encompass one major *business process*, core to their business, namely booking these coaching assignments. People call the company with a request, and the workers go through their database of coaches, matching skills and schedules, and then confirm the arrangement. They also invoice and follow up. The task we track will be called an assignment. This is the name for the task object that happens to be preferred in the company. Each assignment goes through the stages shown in the table below. For each stage we define what the stage is, as well as the role of the employee who will work on that stage. Note that assignments have a many-to-one relationship with both clients and coaches, as one client or coach can be associated with more than one assignment.

The Task Sequence Table illustrates a very straightforward, serial workflow or business process, which our application has partially automated. This is an example of a process that probably would have existed in more or less this structure, prior to the introduction of the Workflow Software. The software application simply helps track, monitor, and facilitate the process.

Stage	Role	Activity
Request	Operator	A client/customer calls in to request a coach.
Assign Coach	Coaching Specialist	The specialist identifies an available coach to match the needs of the customer.
Schedule	Scheduler	Specific arrangements are coordinated between client and coach.
Confirm	Verifier	Arrangements are confirmed shortly before the coaching is scheduled to start.
Invoice	Bookkeeper	Client is invoiced for coaching services upon confirmed schedule.
Review	Client Relations Specialist	A follow-up is done with client and coach to ensure client satisfaction.
(Any Stage)	Manager	Monitors overdue assignments, handles problem situations, and redirects the workflow if necessary.

Figure 1. Sample Application: Task Sequence Table

In a typical workflow application, an individual is assigned a role, indicating which task, stage, or function that individual will have. Thus the system doesn't simply forward the invoicing work to Susan, it forwards it to a Bookkeeper (the role), and it happens that Susan is the bookkeeper. Several people can have the same role, and one person can have two or more roles. (Note: This example shows a one-to-one correspondence between a Stage and a Role. This is not always the case in actual applications.)

Every workday, all the users start the workflow program or application on their computers. The window or screen that opens on each user's computer screen is a to-do list of all the assignments for which he/she is currently responsible. There may be different ways of sorting the list, such as by client name, current stage, due date for the current work to be done, priority, and so on. However, initially, all overdue and nearly overdue assignments will show up on the top of the list, and are flagged as red alerts and yellow alerts with colored rows. Each user's list should normally be relatively small, showing only those assignments for which he/she is currently responsible. By clicking on a row to select one of the assignments, the user will then see a detail screen showing all prior information on the assignment, with places to add details for the current stage. Once the user completes the stage, the assignment will advance automatically to the next stage, and will move to someone else's to-do list.

Work Sequence and Sample User Screens

An "assignment" begins when an Operator takes a phone call (or receives a letter or an email) from a client requesting coaching. The operator creates an Assignment and submits it, which starts the workflow.

Let us imagine that an Operator, Bill Dunbar, takes a call from a client, Eliza Doolittle. As he talks to the client, Bill clicks a button in the application to bring up a screen such as the one below. Based on his conversation he fills in blanks and selects from lists (the areas in white). When finished, he presses the button, "Submit New Assignment," to start the workflow. Note that he can also browse the Client List to find Eliza Doolittle if she has called in before, filling in many blanks automatically, subject to confirmation.

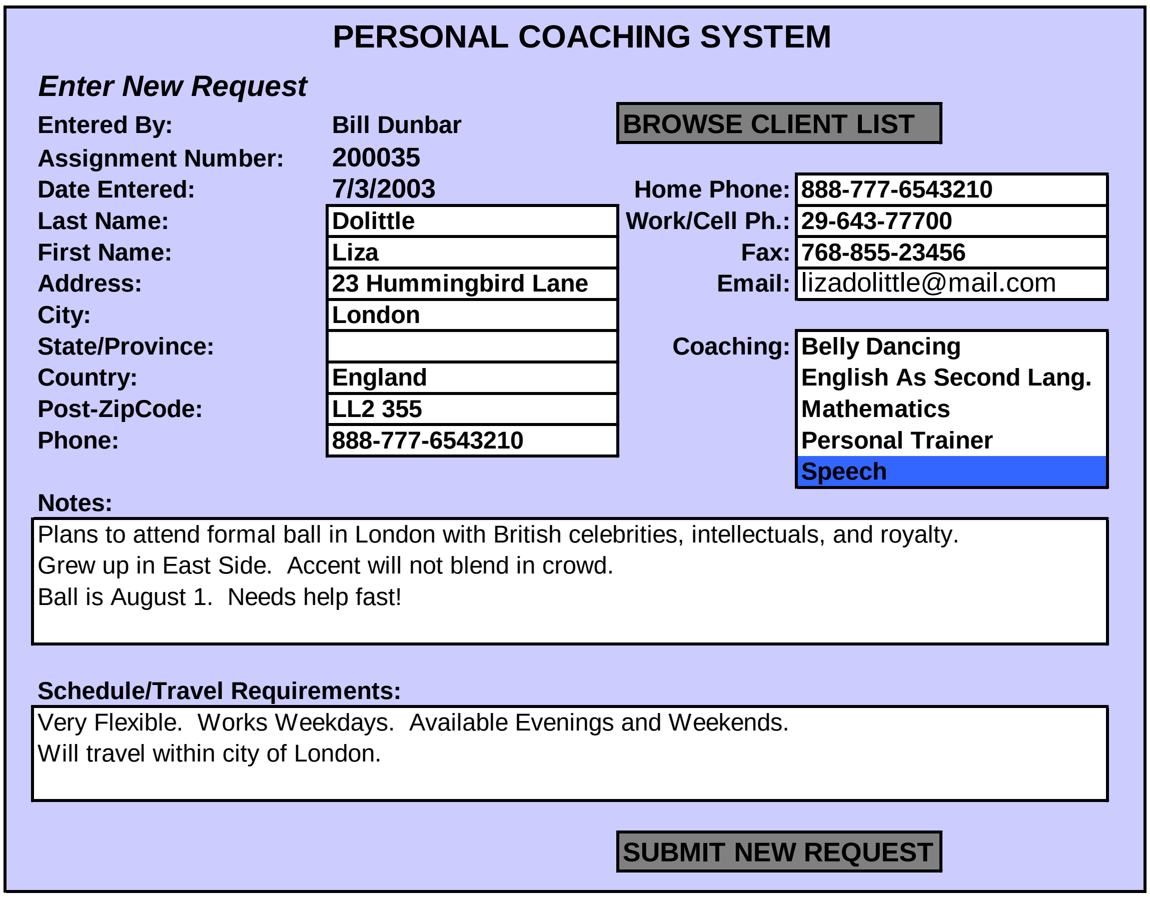

Figure 2. Sample Application Data Screen: Enter New Assignment

Once the Request is submitted, it automatically <u>routes</u> to a Coaching Specialist – in this case Mary Smith. Keep in mind the intelligence programmed into the system. There may be several Coaching Specialists available, but the system picks Mary. How does this work? Each workflow application will have configuration capabilities maintained by an administrator or "superuser" with privileges to configure the system. The system may always send Bill Dunbar's Requests to Mary. Alternatively, it may do load balancing, selecting the Coaching Specialist with the least current work, possibly factoring in vacation schedules. Further, the system could be programmed so that Mary is one of the Coaching Specialists selected to handle speech coaching, because of her knowledge and experience in this area.

Now let's suppose Mary starts the workflow application on her computer on a particular day. She may see a simple screen on her computer like this with the list of the assignments for which she is responsible.

Mary Smith's Assignments List ***July 8, 2003***

Client Name	Stage	Coaching Service	Due Date	Status
Dolittle	Assign Coach	Speech	7-Jul-03	OVERDUE
Garcia	Assign Coach	English/2nd Lang.	8-Jul-03	DUE
Jones	Assign Coach	Personal Trainer	11-Jul-03	OK
Lopez	Assign Coach	Mathematics	11-Jul-03	OK
Thomas	Assign Coach	Personal Trainer	12-Jul-03	OK

Figure 3. *Sample Application To-do List: Mary Smith*

Each row represents an assignment in process. Note that one assignment is overdue (red), and another is due today (yellow). The workflow system is programmed to allow a certain amount of time for the task at each stage to be completed. Thus it flags nearly due and overdue tasks.

Mary immediately sees the overdue Doolittle account, and she clicks anywhere on the row to open it up. When she opens the detail screen it might look something like this.

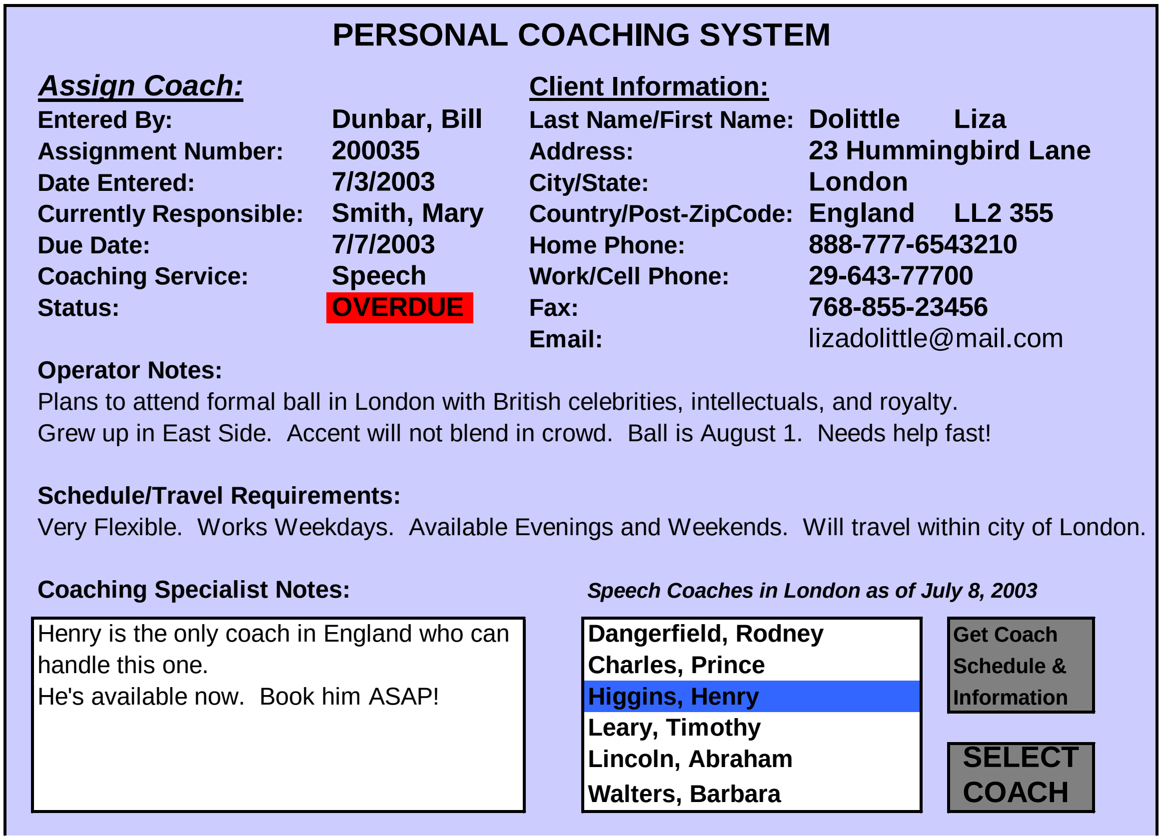

Figure 4. Sample Application Data Screen: Assign Coach

Now she has complete information, and she sees that she must select a speech coach for Eliza Doolittle. Notice that the workflow application has automatically pulled together information on all speech coaches in London. She can select coaches and pull up information about them by clicking the button. She uses her own experience and expertise to make the right match for her client, but she doesn't have to scavenge for basic information. She can add helpful notes for subsequent stages. Once she presses "Select Coach" and confirms, the screen is closed and the Doolittle account is now off her list, and immediately appears on the list of a Scheduler.

The next user we will look at is Al Camus, who has <u>two</u> roles: Scheduler and Client Relations Specialist. He will see a different work list, based on <u>his</u> work. Suppose Mary Smith has finished with the Doolittle account and it has been routed to Al. Al's work list might look like this.

Al Camus's Assignments List			July 8, 2003	
Client Name	Stage	Coaching Service	Due Date	Status
Tomas	Schedule	Speech	7-Jul-03	OVERDUE
Sanders	Review	Mathematics	7-Jul-03	OVERDUE
Dolittle	Schedule	Speech	10-Jul-03	OK
Zales	Schedule	Belly Dancing	11-Jul-03	OK
Pondar	Review	English/2nd Lang.	11-Jul-03	OK
Barnes	Review	Personal Trainer	12-Jul-03	OK

Figure 5. Sample Application To-do List: Al Camus

After Al deals with the overdue Tomas and Sanders assignments, he opens the Doolittle assignment just forwarded by Mary Smith, by clicking anywhere on the row. He may see a screen like the one below.

This is the screen he works with as he contacts the client and coach to work out the schedule. He uses the button to pull up Henry Higgins' information, so he can contact him with some basic information in hand. He fills in the blanks, the checkboxes, and the selection lists as he ties it all up. Four buttons are found at the bottom. One button is used if coach simply cannot be scheduled, which reroutes the assignment back to the Coaching Specialist to try again. Another button is used if the client cancels during the scheduling, which effectively terminates this assignment in the workflow (alternatively, the assignment could be forwarded to a customer relations person to follow-up on why the client bailed out). A "Save" button preserves work in progress. It may take several days for Al to complete the scheduling, so all information he enters into the fields is saved, but the assignment remains in his to-do list. The "Done" button is pressed once the schedule is arranged, causing the assignment to be forwarded automatically to a Verifier, who will confirm the schedule shortly before the training begins.

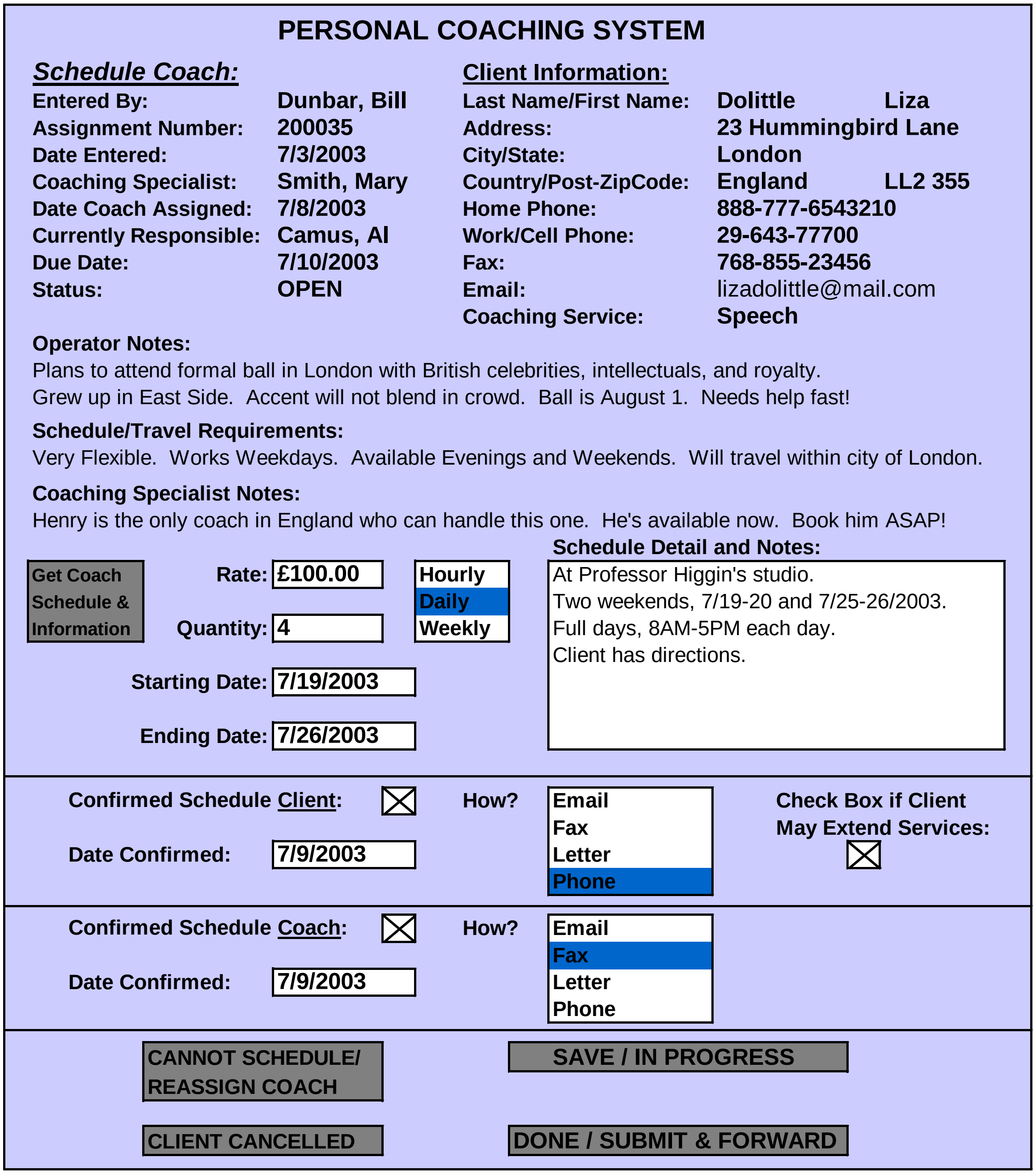

Figure 6. Sample Application Data Screen: Schedule Coach

As you can see, each detail or work screen is designed to capture the work so far, and to provide fields, lists, buttons, etc. to complete the current step. Note that the actual information to fill in is typically very small, but may represent some time and effort – such as researching the specific skills of a potential coach, contacting clients and coaches, and hammering out arrangements over the phone, email, or perhaps in person if the client comes in.

A complete workflow system such as this one would typically have many screens in addition to the samples we have illustrated so far. There would of course be detail screens for subsequent stages of the workflow, Confirm, Invoice, and Review, along the same lines as those we have shown: All prior information and notes would be preserved, and there would be data entry fields pertinent to each new stage, and buttons or other means to display supporting information. In addition, there could be other features in these screens. For example, the invoice screen might include a button to print out an invoice and the mailing envelope, or to send out an invoice email, as well as fields and buttons to process a credit card.

Further, there would be screens showing different lists other than individual to-do lists. These would have sort-ability features, so past assignment histories could be brought up quickly. For example, each worker might have a "my customers" list, showing all customers he/she has processed in the past. There might be a list for each coach of all assignments, with review comments and tabulated scores. The application can provide whatever information is most useful, organized for easy, intuitive access.

Management

Often a manager is not part of the normal flow, but is able to look over all the assignments to monitor progress. She will have a number of assignment lists and other screens available, depending on what she needs to do. In addition, the application may provide her with performance monitoring tools. For example, she could pull up a screen showing the average time it takes to complete assignments by stage. With this information she could tweak the time allotments for each stage to provide faster and/or more reliable flow.

In our sample, if Mary's manager, Sandy, checked one of the management screens, a list showing all overdue accounts, she would see something like this (before Mary Smith finished her work on the Doolittle assignment):

All Overdue Assignments ***July 8, 2003***

Due Date	# Days	# Workdays	Client Name	Stage	Coaching Service	Responsible
3-Jul-03	5	2	Pacino	Assign Coach	Belly Dancing	Davis, Bill
3-Jul-03	5	2	Rosario	Invoice	Personal Trainer	Sands, Amy
7-Jul-03	5	2	Tomas	Schedule	Speech	Camus, Al
7-Jul-03	1	1	Sanders	Review	Mathematics	Camus, Al
7-Jul-03	1	1	Dolittle	Assign Coach	Speech	Smith, Mary

Figure 7.Sample Application To-do List: All Overdue Assignments

This list shows all overdue accounts, sorted by decreasing days late. When the manager clicks on a row to open the detail screen, it is similar to what the specialist at given stage sees, with some differences. Special features are available, such as tools to redirect the assignment. If Sandy were to open the Doolittle assignment before Mary had completed her step, she might see a screen like the one below. In the Management Section, she could pick another Coaching Specialist to pinch hit for Mary Smith to complete the current stage. Notice that she can pull up the calendars of any of the Coaching Specialists to verify availability and workload.

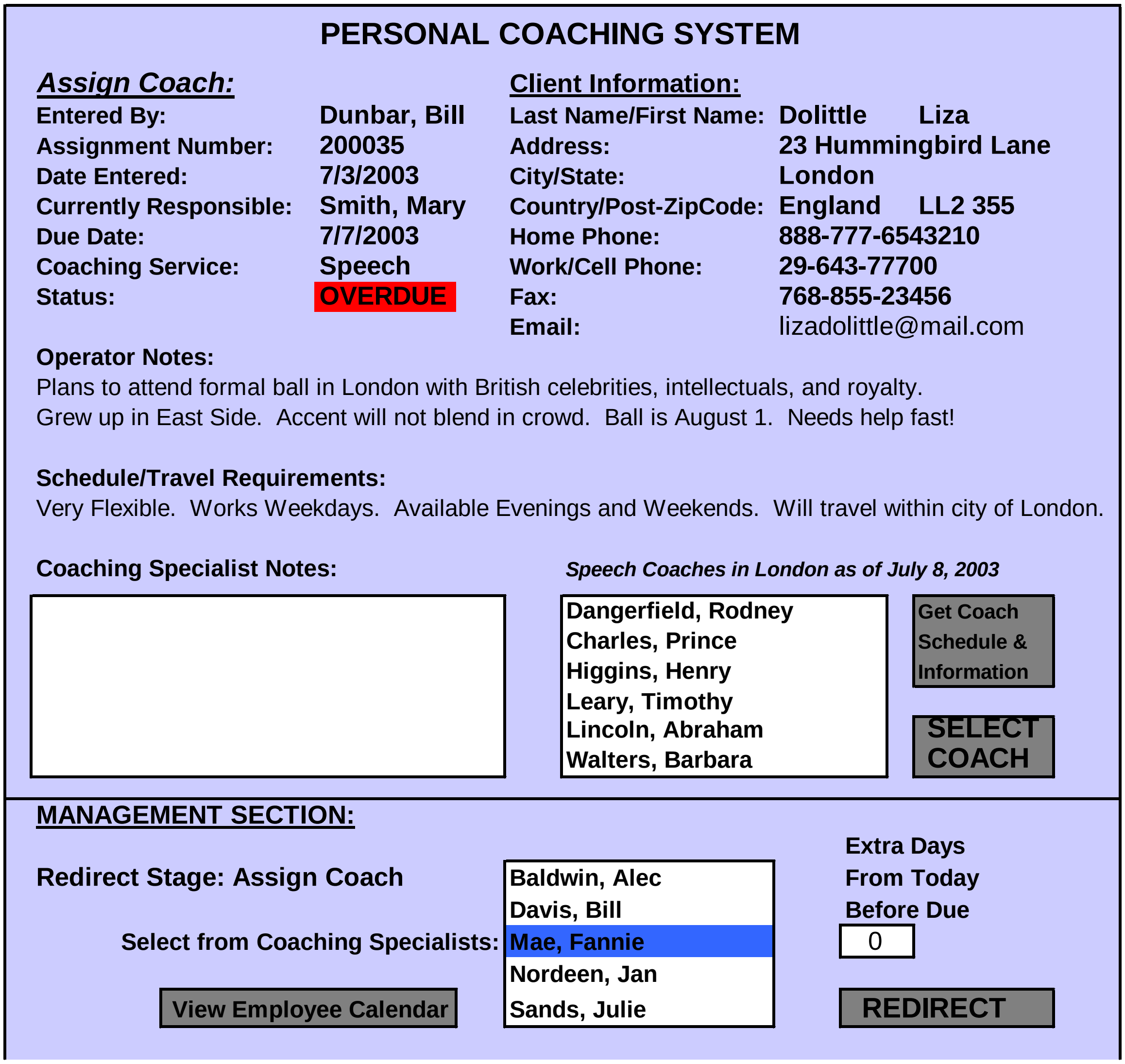

Figure 8. Sample Application Data Screen: Assign Coach, Management

In our sample below, she may know that Mary Smith, being American, took an extra day off for Fourth of July, and she assumes Mary will complete the stage today – so she does not redirect the assignment.

Simple, but Powerful

Our sample application is simple, and its screens are rather crude and basic. There are only a few places to click and key in information, and no special widgets. The reader probably already sees better, more efficient ways of doing things. A real application would likely have richer screens and navigation, especially as the information builds through the various stages of a workflow. However, these sample screens illustrate the basics of Workflow and provide the “look and feel” of how it works.

If the reader is familiar with sophisticated software he or she will see how simple this application is. One average developer, using a rapid application development environment, could probably get a beta version of the *entire* application up and running from scratch in a few weeks.

In this low-tech example, the scheduling of coaches is rather informal, based on phone, fax, and email. Our example would clearly be enhanced if it connected into a full-blown transactional scheduling system for coaches. Obviously such a system would require the coaches contractually to handle their scheduling through that system. If such a system were developed, it would ultimately streamline the process. A further evolution of the system would be to make it web-based, so clients could schedule directly over the internet.

Not all businesses are highly technologized, for a wide variety of reasons. A relatively small business like the coaching brokerage may function well without a fully automated reservation system, and not all coaches would be able or willing to become involved in such a system. In addition, there is a benefit for clients in having the skills and experience of a specialist to assist in matching up the best coach available. A more sophisticated, all web system, would require the client to search through a list of coaches and decide upon one based on information in the website. Often the personal touch of the specialist provides added value for the client.

A low-tech workflow application like this one can really improve the efficiency of a business – by automating select functions and by providing tracking and monitoring for process. For a larger business, perhaps covering a larger geographical territory, considerably more automation would most likely be desirable. Certainly, there would be a rich set of tools to select a good coach – tools to identify more specific skills, view evaluations, rank ratings scores, and so on.

Nevertheless, this low-tech workflow brings a number of benefits both to the managers and the workers:

- It formalizes a pre-existing process to make sure that it runs more consistently.
- It is fairly easy to use (it is not burdensome).
- It saves information so that it won't have to be re-entered.
- It records a complete history of each task, so that the employee who receives a task at each stage has the full context of status and information.
- It organizes business information, such as which coaches specialize in what skills, for easy retrieval.

•It brings useful utilities to both worker and manager to help do their jobs, such as calendars and schedules.

•It provides the manager with easy oversight and intervention capabilities, and also an assessment of job performance.

•It provides a supportive context in which new or reassigned employees can be trained and come up to speed quickly. Therefore it offers enhanced scalability.

The sample application represents a workflow that falls somewhere in the middle, in terms of how much time the workers and managers spend *inside* the application environment, versus how much of their time is spent doing work *outside* that environment – in connection with this coach assignment business process. This would of course vary with the role. The Scheduler, for example, may do most of the work on the phone, or doing faxes and emails. The time spent filling in the assignment detail screen is relatively small by comparison. The Operator and the Coaching Specialist may spend a higher percentage of time inside the application.

Basic Features of Workflow

Our example illustrates the basic features of simple workflow automation. These features, or something similar, will be found in most workflow applications. However, there are many other workflow features, capabilities, and considerations which only appear in more complex applications, and which will not be discussed here.

The basic features are:

1. The workflow handles the progress of the multiple stages or stations of tasks that comprise a business process, from start to finish. The multi-phase task is the process some “thing” or “object” goes through. In our sample the generic name for this object was “assignment,” but there might have been a different name used for the same thing. The object is the specific building up of connections that leads to a completion – in our example, this client wants that type of training, and gets set with this coach, on these dates and times. The object starts as a seed crystal that grows until it is fully formed (or else fails to form). This “growth” is handled in the application simply as connections of data.
2. Typically, upon starting the application, each user sees the specific work on his or her “to-do list” – though the user may have accesses to other lists and information as well, for example, *all my tasks in process*, *all my tasks that have been closed, all clients*, or *all coaches*.
3. Unless they are managers, users do not see work that is currently assigned to others, at least in their primary working lists. In a small business like our example, the only internal security is probably going to be to prevent workers from *modifying* objects out of turn. They might well be allowed to *see* all objects, at least in secondary lists. In a larger organization, however, objects may not be visible at all to workers unless they are specifically involved with them. Security and visibility are topics that go beyond the basics, but suffice it to say that are set up according to specific business policies and requirements.

4. The software brings materials and information to the user to assist or enable the work to be completed at each stage. In some cases, the work can be accomplished on the spot, from the computer screen. In other cases, more work or time is involved.
5. Workflow tracks the sequence of activity and the build-up of information as users complete their stages. It maintains a full history or audit trail of how the process progresses.
6. As a stage is completed or milestone is attained, the work “moves” automatically. It advances to the next stage. It disappears from one user’s to-do list, and appears on another’s. The detail screens reflect the changes and progress, and also show whatever information is germane to the next stage. Thus the system can be seen as an *assembly line built in cyberspace*. There are no physical conveyor belts; things move simply by change of status within the application.
7. As work progresses, the status and stage are updated in all lists of objects for all users who have permission to see those objects in process.
8. Workflow is designed for time-driven or time-sensitive processes. It monitors the timing and timeliness of events.
9. Workflow alerts users and managers when tasks and sequences are “coming up,” or “late,” so that immediate action can be taken.
10. A manager has summary and oversight lists, as well as various workflow management capabilities, which other users do not.
11. Individuals work as themselves, but they are also assigned roles. A role represents a group identity with certain privileges and responsibilities in the system. Work is sometimes assigned on the basis of role. For example, the system may forward a task to the person in a particular role who has the lightest current workload. However, the system may also factor in more specific attributes of the individual that are relevant to the task. These attributes may in turn be defined by additional roles or sub-roles.
12. Workflow makes provisions for handling situations like absenteeism, worker overload, or other sub- or non-performance.

Our example will assist the reader in looking at other business processes in order to see where the well structured pathways are that may be amenable to workflow automation, and also how an automation can tie together and facilitate a process that may currently be disjointed.