

**REGATTA PROJECT:
A TOOL FOR BUSINESS PROCESS REENGINEERING**

Keith D Swenson

Open Systems Solutions, Inc.
3055 Orchard Drive
San Jose, CA, 95134
USA

kswenson@ossi.com
voice: +1 408 456 7667
fax: +1 408 456 7050

The Regatta project takes a fresh approach to the coordination technology problem by supporting the modelling and re-engineering of business processes from an interpersonal communication and negotiation perspective. Our goal is to involve the entire team in the planning process, each person laying out the plan for their own processes according to their own expertise. Then progress along the plan is supported and tracked such that any member can find the project status at any time. The plan can embody decisions and can also be changed as needed to handle unexpected exceptions. The result is a coordination environment that allows each individual to work in their own way, gives the group information about current project status, and provides management with the information needed to manage the project.

1. Introduction

The Regatta group was formed in 1991 in order to develop software to support workgroups, more commonly known as groupware. We have two products: Regatta Directory Service (RDS) and Regatta Automated Software Process (RASP).

1.1 What Is Groupware?

Groupware is a very broad field, that is defined differently by just about everyone who attempts to. We are actually concentrating on a part of groupware that is usually referred to as "Coordination Technology". This area deals with how people coordinate their own activities within a team.

1.2 Our Approach

Our approach is to empower the worker and decision maker, by facilitating information flow so that a person has the information that he needs to make decisions and to take actions. We model business processes, but only when those processes involve more than one person.

1.3 Our Vision

Companies and organizations are evolving to a more efficient form called a "Learning Organization"[Senge 90]. This is an organization that has been transformed by Information Technology (IT) to be much more efficient and able to respond to today's increasingly unpredictable market pressures.

1.4 Our Goal

To make software that:

1. supports the *coordination* of activities of different members of a group.
2. allows every individual in a group to gain a better *understanding* of how their group or organization works.
3. supports the process of *change* in order to allow the group to fine tune its policies.
4. helps preserve *corporate memory* of what the organization actually has done.

2. The Demand for Business Process Re-engineering

There is a tremendous demand for the capabilities that we are developing. Since the groupware product market is not mature, to understand the demand one needs to examine software, organizational productivity, and how they relate to each other.

2.1 There is little evidence of increase in White Collar Productivity due to Computerization.

"While manufacturing productivity continues to rise steadily, white-collar productivity has remained virtually static, despite the widespread introduction of information technology" [Hales 91]

It is ironic that this segment of the work force is the most expensive, and therefore companies have the most to gain from productivity improvements in this segment. A similar statement came from the MIT90s study:

"the evidence at the aggregate level does not indicate any improvements in productivity or profitability" [Morton 91]

2.2 MIT90s study

The MIT Sloan School of Management together with 10 large corporate sponsors has recently concluded an 8 year study of the effects of IT on organizations. This is the "Management in the 1990's" (MIT90s) program. The 6 conclusions that they have come to are:

1. IT is enabling fundamental changes in the way work is done.
2. IT is enabling integration of business functions at all levels within and between organizations.
3. IT is causing a shift in the competitive climate in many industries.
4. IT presents new strategic opportunities for organizations to reassess their missions and operations.
5. Successful applications of IT will require changes in management and organizational structure.
6. A major challenge for the management in the 1990s will be to lead their organizations through the transformations necessary to prosper in the globally competitive environment.

The first three are not surprising, but note that the last three specifically deal with change in the organization. This conclusion that IT does not inherently increase productivity, but instead enables changes that can increase productivity are best stated in the following:

"It is possible, however, for an organization of the 90's to capture benefit [from IT]. This appears to come from being an early (or different) mover with a business benefit enabled by IT and then investing actively in innovations that continue to increase the benefit to the user of the innovation. In other words, the benefits do not flow from the mere use of IT, but arise from the human, organizational, and system innovations that are added onto the original business benefit. IT is merely an enabler that offers an organization the opportunity to vigorously invest in added innovations if it wishes to stay ahead of its competitors." [Morton 91]

2.3 Business Process Re-engineering (BPR)

Business Process *Re-engineering* was popularized by Michael Hammer in his July/August 1990 article in the Harvard Business Review called "*Re-engineering Work: Don't Automate, Obliterate.*" In this article Hammer warns against merely automating existing tasks, but rather to consider the benefits of IT, and to completely redesign the organization to work in new ways that are supported by IT.

"We must have the boldness to imagine taking 78 days out of an 80 day turnaround time, cutting 75% of the overhead, and eliminating 80% of the errors. [Hammer 90]

2.4 Examples of the Benefit of BPR

At Mutual Benefit Life (MBL) underwriting a life insurance policy involved 40 steps carried out in 12 different departments. The process was streamlined by instituting case managers, who were made responsible for virtually the whole underwriting process. Productivity was doubled. IT played a crucial role, in enabling managers to pull in data from many different sources. They did not just automate the existing workflow, they invented new ones that were supported by IT, cutting steps, cutting useless extra work.

At TRW a purchasing procedure was cut from 460 steps (typically taking 116 days) to 113 steps and 50 days.

Reuters provides a complete range of financial information services. Customers change requirement frequently, and they have a hard time keeping up. A major redesign of the company's order-to-billing cycle from many weeks to a few days. Reuters trimmed its costs and improved its service to customers.

"Workflow management frequently boosts white-collar productivity by 30 to 40%." [Hales 91]

"Re-engineering is about reducing response times by 80%, and reducing costs by 50%" [ITH 92]

2.5 Growth of BPR industry

Already there is a healthy number of consulting services companies to help organizations learn about and utilize BPR. As evidence of this, Ken Orr's annual Monterey Software Conference in April 1992 was devoted to BPR.

There is also signs that this area is one of the fastest growing segments of the computer industry. IDC predicts a 46% annual growth in BPR services.

3. Description of RASP

RASP is designed to support business process automation and business process re-engineering by allowing team members to take part in the planning and re-engineering process.

3.1 Communication

Although we speak about supporting business processes, it is more accurate to say that we support the communications required to coordinate the processes. This is an important distinction because we are not replacing the tools that people currently use. People can continue to use their favorite word processors, spreadsheets, project management tools, CASE tools, etc. Though we are not replacing any existing tools (except possibly email) there is evidence that support of this communication by itself would be a significant benefit to the team:

“Communication -- sharing information -- can account for up to 90% of the project activity.”
[Grenier 92]

One study showed that only 12% of office time is spend on all standard transactions formally defined and executed. 53% of the activity was part of the formal system, but required extra communication by the user. [Strassman 85]

In RASP the action to create a question, request, or task automatically doubles as the action to send messages/information to the people involved. Completion of steps in a process automatically informs those waiting on that completion.

3.2 RASP built on Trading Model

RASP is based on a negotiation model of human interaction. The user may make a request to anyone. That person may accept or decline the responsibility. If accepted, then that person is expected to complete the task at some time later. This is somewhat similar to the work done by Winograd, et. al.[Medina-Mora 92]

Acceptance may start a sub-process; this process is defined by the recipient of the request. Users may automate the response to requests that are common. Users may use this mechanism to “advertise” services that they perform.

3.3 RASP structures the communication

Each action -- requesting, accepting, declining, completing -- carries a message with it for clarification. All of the messages are kept in an organized fashion for review at any time. All of the communications takes place within the context of a colloquy. The colloquy itself may retain information to be communicated, such as the file being worked upon, or the people involved.

3.4 The Visual Process Language

Users create policies (which are business process models) with an easy to use diagramming tool. Each user creates a picture of the service he performs. These pictures are composed of stages, which are steps in the policy that must be performed by the user or by someone else.

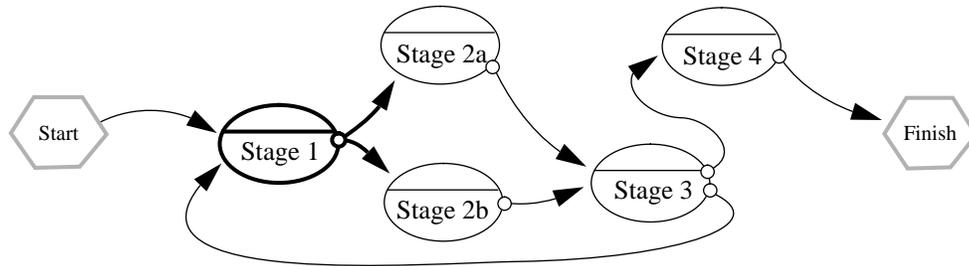


Figure 1: Visual Process Language (VPL)

Although creating a stage is like sending a message to someone, the message is not actually sent until the stage is “activated”. Stages can be activated by the completion of another stage. Thus the sending of the messages is effectively delayed until the appropriate time. This is how RASP coordinates a group’s activity..

3.5 RASP can be used by non-experts

The graphical planning tool requires no more sophistication to use than it takes to use a spreadsheet. It will be far easier to use than electronic mail for coordinating activities.

Creating a policy, or “business process model”, is not complex at all, for three main reasons:

1. One needs to model only those steps that oneself will take or delegate to others. How the delegated task is completed is not of concern.
2. One needs to model only those steps that need to be communicated. RASP does not require that all the fine structure be added in.
3. The model need not be complete in accounts for every possible exception because these can be easily added later if needed as they arise.

3.6 RASP follows organizational structure

RASP is “organization aware”. The policies that you use depend upon the policies you have made for yourself, or upon policies for your group, and finally upon policies for the entire organization. This allows a new user to get started using the “default” policies of the organization, but then to customize those policies as needed to match the way he works, or the way the local group works.

3.7 RASP Architecture

These policies are actualized on a centralized Colloquy Server. Each user runs a Viewer, which is the client side and user interface of the product. Each policy has a number of forms that display and manipulate information.

3.8 Tool Bus and TCL

All viewers and servers communicate via a “Tool Bus”. All programs communicating over the ToolBus send and receive messages formatted using a standard language syntax, TCL (Tool Control Language).[Ousterhout 92] This standard language gives us the greatest assurance for an open standard for other suppliers to interoperate with. Forms and actions are expressed in TCL.

3.9 History is kept automatically

As a particular colloquy proceeds, a record of all the actions is kept with it. This greatly simplifies the communications between people who are coordinating in a given colloquy.

3.10 Automation of Tasks

The RASP TCL language can also be used to control external tools. Every stage object can have a TCL formula with it that automatically runs other programs, or communicates to other tools using ToolTalk.

3.11 Just in Time Information

Rather than flooding users with all the tasks that need to be done, RASP presents an active list of stages that are currently waiting for that user to take an action on. Tasks do not appear on this list until all of the preconditions are met. A task does not appear if it is automated or if it is currently waiting on a sub-task. Help information is available on forms and actions, so that you do not need to learn how things work ahead of time. This philosophy of just-in-time information greatly reduces the burden on the user of the system.

3.12 What we are not doing

We are not attempting to automate the work of individuals. Tools exist already to do this. For example we are not going to replace “make”. Different people will use different tools for their differing jobs. We will work with these tools, yet supplement them in order to span the gap between people.

Furthermore, it is difficult (or impossible) to model activities at this level of detail where activities are complex and not outwardly known.[Osterweil 87] We instead model the interpersonal behavior which while being complex, is at least observable and well defined in that we all can agree upon the meaning of requests and questions.

Automating at the micro level removes the flexibility that people need to find new ways to get things done. Our observation has been that people know how to do their job. Yet the lack of performance improvements can be attributed to the poor way that tasks are communicated and coordinated. We aim at this latter problem.

3.13 RASP Feature Summary

With RASP people can communicate what they are doing, and what they need to have done. Negotiation is built in. Routine activities can be automated. Each person or group can define their own policies, or they can use the organizations. The repeatability and the reliability of business processes are improved. Furthermore, because RASP makes the business process visible in the form of a graphical diagram, the process can be reviewed and improved, to achieve potentially tremendous gains in productivity.

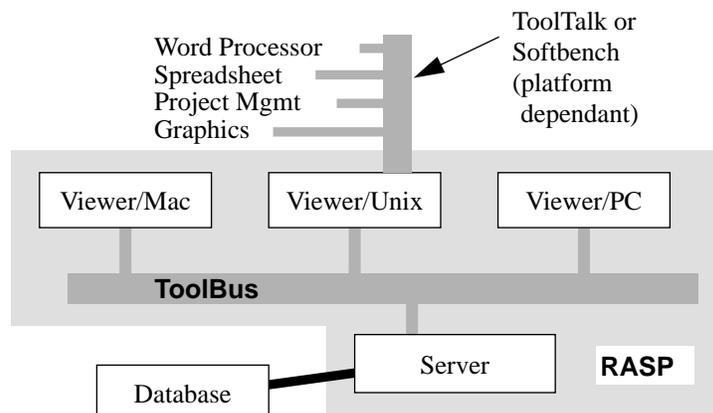


Figure 2: RASP Architecture Diagram

4. Technological Pitfalls

This section discusses potential solutions that must be avoided, and we describe how RASP avoids them.

4.1 Solution must allow for the fact that organizations are viewed differently by different people.

Every role within an organization is unique, and the view of the organization from that role is similarly unique.

“Groups of people who, because of role, profession, or other affinity have similar interpretations of specific information, form what we call infolects, which are analogous to language dialects. Problems [causing barriers to communication] arise, not within infolects, but between them: the information is not totally incomprehensible to another infolect, but it is perceived differently.” [Grenier 92]

It is important to realize that there is no single “correct” view of the organization. Most business process software requires a single overall picture of the business process. These packages will have difficulty being accepted by more than a few of the different groups within the organization. RASP allows each group to define their own processes.

4.2 A specialist must not be required in order to model business processes.

In order to implement a workflow process in most workflow packages requires a specialist who is familiar with a scripting language, and knows how to “linearize” a user activity.

“Most workflow packages distinguish between developer mode, and user mode. Process definition often requires a scripting language.”[Hales 91]

If a specialist is required, then the organizational view of the specialist will naturally be embodied in the script. It is important to allow people to design the process according to their view, and not according to an external view.[Grudin 90]

RASP is designed from the beginning to be easy and uncomplicated in order to involve the actual user as much as possible.

4.3 Restrictive workflow fails to meet needs.

There are numerous examples of attempts to implement productivity increasing software that have failed to be accepted by the users themselves. There are some powerful social factors that must be kept in mind.

“Historically, IS organizations have run afoul by attempting to dictate business processes as a by product of information system development. Aggressive, poorly planned pursuit of BPR can alienate users and user management”[Gartner 91]

“In extreme cases, users even experience increased powerlessness when forced to use a rigid, constraining, inscrutable and unreliable computer system - and hence from the users perspective, the very antithesis of the ideal tool.”[Clement 90]

The tool must be empowering, not restrictive. The user needs to be in control of the way the tool works. With negotiation built in, giving each person the ability to customize policies, and ability to modify policies on the fly in the case of exceptions, we insure that the user’s needs are met.

4.4 The organization must not be locked into a static Business Process Model.

It is important to remember that organizations are continually changing. If it takes a specialist and a tiger team 6 months to discover and implement the business processes for an organization, then you will already be out of date. In RASP, the processes for a group can be changed when that group changes, without having to redesign the process for the entire company. This also distrib-

utes the responsibility for defining the process, removing a bottleneck formed when a single group is responsible for defining all the processes.

4.5 Business Processes are Complex

To completely model a business process, the result is surprisingly complex.[Strassman 85] RASP avoids this problem not requiring that the model be complete. In RASP a user models the most common process, makes this process visible to all users, and when an exception occurs, the user can “override” the process.

4.6 Real work is not as the company manual describes.

Studies of work and user interfaces show that the actual work that people do often bears no resemblance to the way that work is described officially:

People don't carry out procedures. In deference to the theory of how office work should operate, people usually report their experiences of this fact either in the form of apologies, or complaints to the effect that, while procedures sound nice, to the extent that they fail to take into account the complexity of the actual cases, they don't actually tell you what to do.” [Suchman 83]

The danger here is that a system that implements a particular “official” view of the process will fail to gain user acceptance because it does not match the way users really work. RASP does not attempt to automate at the micro level. At the interpersonal level we provide flexibility to let people modify the process at any time. We believe that this best matches the real world behavior of “follow the manual if it works, but do whatever is necessary to get the job done.”

5. Conclusion

5.1 RASP Project Status

RASP will enter beta testing in December. We will then use three months time to gather inputs and to refine the product for a release in the Summer. The server and client both run on a Unix workstation (SPARCstation for now) with an XWindows user interface. A MS Windows supported client is expected in 1993.

5.2 Foundation

We have been working very closely with Dr. Simon Kaplan from University of Illinois, and his team there (Bill Tolone, Doug Bogia, and some others).[Kaplan 92] They have successfully implemented a prototype of the RASP system in their groupware system, ConversationBuilder. We are indebted to their good work.

5.3 Summary

This document has presented evidence that Business Process Re-engineering is an area that will yield tangible results, and is a very rapidly growing segment of the computer industry. We have also presented pitfalls to avoid in meeting this demand. Finally in the description of the RASP system we hope it is clear that RASP provides a system that meets the demands of the business user, while avoiding the pitfalls, and provides a superior solution.

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