4.1 Introduction

BPR emphasizes the benefits that a process orientated view of company operations can bring. Acquiring a clear definition of the “As-Is” business process and developing an understanding about how the process may be reengineered is a crucial stage in any business process reengineering project. This early phase normally has three objectives: to achieve a full understanding of the process to be reengineered so as to clarify its objectives and characteristics; to create a shared vision and understanding among the reengineering team; and to have a basis for starting the redesign. To support this phase, there is a whole range of tools in the market place which are traditionally used to help in the activities of process definition and analysis.

Creating charts and diagrams is a critical part of Business Process Reengineering. From flowcharts and organization charts to computer networks to database designs – visualizing a process is the first key to understanding it. Not all business process reengineering tools are the same, they each have particular strengths. In this project, a minimum of three widely used BPR tools namely SmartDraw, BONAPART and WebSphere Business Modeler were chosen to be analyzed. This selection of tools complies with the requirement stated in Objective 1 as stated in section 1.6. Six categories were seen as essential in analyzing these tools. These include:

- hardware and software features;
- user features;
- modeling capabilities;
- simulation capabilities;
- analysis capabilities;
- Integration capabilities.

### 4.1.1 Hardware and Software

This is to determine if the software requires high hardware / software requirements in order to utilize it. Since there are different operating systems used in the market it is vital to consider whether the software can be run in different operating systems.

*Platforms and operating systems:* The wider the number of platforms and operating systems the software can work on, the better it is. As different computer systems might be used by the people who work across the globe on the same development project, the software should be run in all the operating systems.

*Database repository and client-server:* The software need to have a mechanism for storing the information in a common repository. This way all the information can be accessed from a single source and can be shared across the company. This is very useful for a development project, where the work is normally done in different places. By having a common repository and networking capability, the problems of redundancy are avoided.

*External links:* Does the software have export-import features? Can word processing tools, spreadsheet tools, reporting tools etc. be linked to it?

*Tool integration:* Does the tool have a capability to be integrated with other tools or vice versa? It could have one or more modes of integration such as, it can be integrated with other point-solution tools, have its own integration environment or have an open architecture so that it can be incorporated in an integration framework.
4.1.2 User features

This is to indicate the various features that each tool has in order to assist the user to get used to the system regardless of the computer knowledge they have.

*User friendly:* If the tool is user friendly then, the input data can easily be entered and also the output is presented in a way that is easily understood by the user.

*Graphical user interface (GUI):* Does the software have a graphical user interface so that the required information or data can be entered through several windows?

*Online documentation and help:* The user should be able to get help on a specific feature on a click of a button.

*Special features:* The tool should have a number of special features that improves the capability and user friendliness.

4.1.3 Modeling Capabilities

This is to determine if the software has any modeling capability. Modeling is vital to have an overall picture of the processes flow.

*Goal centred:* This means the process or reengineering goals are identified first and then the reengineering or improvements are carried out in agreement with the goals.

*Roles:* It determines if the software tool can identify the different roles in the process. Roles can be the activities as performed by a person. Hence this is very useful in reengineering.

*Data flow:* Does the software use data flow diagrams to model the process?
**Front end analysis:** Can the tool check the model for syntax and logic? In this way the model can be corrected before it is run.

**Ease of modeling:** How easy is it to model the process in terms of the graphical drawing and the data entry?

**Level of detail:** How detailed can the model be drawn? This indicates the accuracy of the model.

**Concurrency and interdependency:** This is very important for Product Introduction Process (PIP), as a number of activities in PIP are operating concurrently and there is constant exchange of information between the activities.

**Object-orientation:** Can we assign attributes to the various objects defined in a process? Attribute here refers to the distinguishing characteristics of an object, such as, height, size, cost, time scale etc.

**Customization of blocks:** A tool cannot have all the iconic blocks needed for analysis and graphical presentation, hence does the tool have an open architecture so that user customized icons can be created.

### 4.1.4 Simulation Capabilities

This is to determine if the software has any simulation capability. Simulation is an effective means of analyzing a process. The resource constraints, idle time, delays etc. can be identified by simulating a process iteratively.
The factors considered are:

*Time:* This feature identifies if the tool can track time. This is very useful in determining the duration of a “to-be” operation from start to finish.

*Cost:* Can the tool track the cost changes as it is simulated?

*Distributions:* Can statistical distributions be used to trigger the input or to simulate activities? This will help determine the variation in the behaviour of an activity under different situations.

*Animation/graphical capability:* A visual representation of a tool is very effective in analysis.

*Discrete event modeling:* Most activities do not occur in a fixed predictable period of time. Thus an effective tool should be able to vary the timing of events, tasks and processes to generate a realistic picture.

### 4.1.5 Analysis Capabilities

The analytical capability in a tool is vital for finding means for improvement. Some of the factors considered are:

*Reasoning:* Can the software reason with the information supplied and take decisions accordingly? The reasoning would be done through a knowledge shell or expert system stored in the tool.

*Output analysis:* Can the tool analyse the output for a process run? It refers to the ability of the tool to present the output in an understandable and effective format and draw conclusions.
**BPR expertise:** Does the tool have any BPR expertise in relation to the factors identified by Hammer *et al.* such as, determining decision points, tracing the information source in a process, posing questions for dramatic improvement etc.?

**What-if analysis:** Does the tool provide a means for simulating and considering the effect of different scenarios?

**Top-down, bottom-up and outside-in analysis:** Does the tool have the flexibility to map the process from bottom-up and top-down? Can the effect of changes in external environment, such as technology etc. be considered?

### 4.1.6 Integration Capabilities

Does the tool have an enterprise perspective? An important aspect of enterprise integration is the ability to look at the process from different views such as the information view, behavioural view, organizational view, decisional view etc. The information view can help in designing an appropriate information system tailored to the requirement. Similarly the decision view can help in determining if the decision-making power is in the right hands. Following are the factors:

**Integration of views:** Can the user look at the process from a data view and shift to a activity view? Does the tool consider the effect of interrelationship between the organisation, information etc.?

**Business level to physical level link:** Can the tool link to the business goals and help in reengineering the strategic issues of the process? Can the tool link to the physical systems in the firm, where the improvements suggested from the IT perspectives are directly
translated into the systems? Does the tool have the flexibility and intelligence to make improvements from the strategic to the tactical level of the business?

4.2 BPR Case Tool I: SmartDraw

Founded in 1994, SmartDraw.com is the creator of SmartDraw, the *World’s Most Popular Business Graphics Software*. SmartDraw makes it easy for anyone to create professional, quality business graphics such as flowcharts, org charts, Gantt charts, timelines, floor plans and more in minutes - no experience or training required. Each day more than 6000 people install SmartDraw for the first time and more than 10 million users have downloaded SmartDraw (www.smartdraw.com). SmartDraw is the easy drawing software that helps to create perfect Business Process Reengineering documentation. With the SmartDraw can easily create:

- Process Flowcharts
- Project Charters
- Workflow Diagrams
- Affinity Diagrams
- Force Field Analysis
- Gantt Charts
- Decision Support Charts
- Decision Matrix
- House of Quality Matrix
- Requirement Statements
4.2.1 **Hardware and software features**

i) **System Requirements**

SmartDraw requires running in minimum of Windows 2000, or XP or Vista which are the common operating systems used widely. The hard disk space required is to be between 100MB and 2.5GB with 128 MB of RAM and 800 x 600 resolution and 16 million colors.

ii) **Integration with Other Programs**

A fundamental benefit of SmartDraw is that it works hand-in-hand with Microsoft Office and many of the other programs and products which most of the users may already know. The major commands and functions are similar to those who had been accustomed to using in programs such as Word, Excel, and PowerPoint. They work in virtually the same way in SmartDraw such as copy and paste, drag and drop etc. Moving a SmartDraw drawing into Office applications is as simple as copy and paste; there's no complicated file exporting or document reformatting necessary. And the same goes for dropping Office elements, such as a table or fancy text, into SmartDraw: just copy and paste.

There are many other ways in which SmartDraw works well with the business tools used every day.

- SmartDraw graphics become "live" in Office and vice-versa: just double-click on any object to change it. The changes made are updated automatically.
- MS Office users can add MS clipart, graphics, charts, and equations directly from the SmartDraw toolbar, or choose from SmartDraw's pre-designed galleries of graphs, text-styles, and symbols.
- Export and import images in popular graphics formats including, WMF, BMP, JPG, GIF, TIF, and many others.
- Save drawings for the web as GIF, JPG, or HTML
- Easily convert drawings made in other software:
  - **Convert Visio or FlowCharter files to a SmartDraw format:** If there are diagrams or plans previously created in Visio or FlowCharter, the SmartDraw File Conversion Wizard can quickly convert all of them to SmartDraw format in a single operation!
  - **Convert other file types, too:** SmartDraw's File Conversion Wizard also works with other diagramming programs that follow standard Windows object linking and embedding conventions.
- Advanced Import/Export Filters: Share drawings with office colleague’s using Encapsulated Postscript (EPS), AutoCAD (DXF and DWG), Adobe Illustrator, Acrobat, CorelDraw, and other popular formats! (*SmartDraw imports DWG to ACAD 13 and DXF to ACAD 14.*)
- Email a drawing to others in a single click.
- Hyperlink symbols or text in the SmartDraw drawings created to a web page, to another SmartDraw document, even to a Word document or program.
- Export the SmartDraw drawing as an HTML file with working hyperlinks
- Share SmartDraw drawing even with those who don't have SmartDraw using the free **Viewer**.

### iii) Share Work with Co-Workers and Clients for Free

When a company owns a SmartDraw, anyone inside or outside of the organization can download this viewer to see or print SmartDraw drawings. Any hyperlinks in the drawings will also work in the free viewer.
The viewer is less than 500 KB, so downloading it is fast and easy for anyone (just a few minutes on a 56K modem).

4.2.2 User features

i) Ease of Use

No design experience or even artistic skill is required to create professional charts, diagrams and graphics with SmartDraw: the "talent" is built-in. With SmartDraw user can create flow charts, block diagrams, data flow diagrams, decision trees, organizational charts, network diagrams, floor plans, process flow diagrams, schematics, Gantt charts, calendars, quality management diagrams, electrical and mechanical drawings, chemistry diagrams, timelines, space plans, flyers, posters, banners, maps, forms, and more in just a few minutes—there is no learning curve at all.

- Simple drag-and-drop drawing let the user to use any of the thousands of pre-defined shapes with one click, which will enable user to complete their project fast.

- Easily link shapes to other shapes and to borders: just drop shapes near each other and they link automatically. This feature is especially handy when the user may be, for example, connecting a window to a wall within a floor plan.

- Automatically insert connecting lines between shapes using Auto Flow. Just drag a symbol next to another symbol and a line automatically and perfectly connects the two shapes without the user having to lift a finger.

- Work with a friendly, familiar interface (similar to Word).

- Org Chart Builder/Export: Build an organizational chart automatically with the Org Chart Builder (new in version 7). Simply import a properly formatted file containing org chart data (such as a spreadsheet) and SmartDraw automatically
builds the chart for us. This also works "in reverse" as we can export to a data file from an existing chart.

- Month Wizard: plan as far ahead into the future as we desire; just enter a month and year, and the calendar we want is there.
- A built-in spell checker addresses all spelling errors.
- Work easily with other commonly used file formats.
- By providing ready-made templates and built-in collections of business graphics, SmartDraw allows users to simply "drag-and-drop" elements to create perfect-looking charts in minutes.

ii) **Free Help, Free Support, Unlimited Downloads and More**

**Help:** Should the user require a few pointers, a tip, or a guide to see through, SmartDraw provides many different aids to help develop the user’s drawings

- Wizards that walk through each step in creating, for example, work flow diagrams, flow charts, and organizational charts.
- Built-in *Hints* to guide as the user creates own drawings.
- In-depth **tutorials** and helpful **examples** to both help user understand the "finished product" and to give basic instruction.
- ToolTips that automatically label buttons on the toolbar.
- Extensive online help is available for every command.
- An easy-to-read electronic user's guide is available **free online** or on the CD-ROM

SmartDraw also provides **free, live, in-house support** available to user for as long as the user owns a SmartDraw.
4.2.3 Modeling Capabilities

i) Document the Existing Processes

Before improving a process, it’s a must to know how it's currently working. Even when no improvement is necessary, documenting existing processes is a key step to achieving consistent quality. A flowchart is the easiest way to illustrate the steps in any process or procedure. By visualizing the process, a flowchart can quickly help identify bottlenecks and places where the process can be streamlined or improved. From the completed flowchart it’s very much easy to determine whether errors and inefficiencies are inherent in the process or whether the errors are a result of employees not following the process as charted. Few questions will arise:

- Can the same process be completed using fewer steps?
- Are there redundancies?
- Are there unnecessary delays?
- Where do most errors or defects occur?

4.2.4 Analysis Capabilities

i) Interrelationship Diagrams (ID)

An Interrelationship Diagram template provided by SmartDraw allows to explore cause-and-effect relationships between critical issues. Write the issues on individual rectangles or circles and spread them in a roughly circular pattern. Start with one issue and look for cause-effect-relationships with each of the others in the diagram. When a relationship is established, draw a single directional arrow in the direction of the stronger cause or influence between the two. Move through all the issues in the diagram in this manner. Once the diagram is complete, you now can tally the number of arrows each issue
has been associated with. The issue with the greatest number of outgoing arrows is a root cause or driver, a potential critical problem that should be explored further. The task with the greatest number of incoming arrows represents the key outcome of these causal factors.

4.2.5 Integration Capabilities

i) Translate Customer Comments into Specific Requirements

After gathering feedback from customers, there is a need to consolidate it into a list of specific problems and concrete requirements for solving them. For example, if customers complain of poor service, it's not sufficient to set a broad goal such as "Improve Service." The Business Process Reengineering strategy requires tangible, measurable goals, such as replying to e-mails within 24 hours. SmartDraw provides a number of templates including Requirement Worksheets and Critical-to-Quality Trees (CQT) to help to categorize quality requirements based on surveys and customer feedback.

ii) Requirement Worksheet

A Requirement Worksheet is a table divided into three columns. In the first column, the user should list customer comments. In the second column, user could distill the comments into a list of general problems or issues and, in the last column, state the quality requirements that will address the problem.

iii) Critical-to-Quality Tree

A Critical-to-Quality Tree (CQT) guides the user through the process of taking a general comment or problem and breaking it down into increasing levels of detailed requirements, actions, and measurable goals. Using a CQT, the user can translate theory into real world plans and manage otherwise seemingly complex issues. Place the problem
(perhaps identified by customer or employee feedback) in the first box on the tree. Then write increasingly specific, measurable goals in the boxes to the right.

4.3 BPR Case Tool II: BONAPART

BONAPART business processes and organizational structures establish a framework of up-to-date organizational knowledge thereby ensuring continuous process and organizational improvement. BONAPART offers everything that a user expects from a professional tool for business process modeling to all elements of the organization, various graphical visualization and publishing options, extensive analysis and simulation functionalities. The consequent object orientation makes modeling of complex structures easy and ensures optimum results.

![Figure 4.1: BONAPART Functionalities](http://www.eil.utoronto.ca/tool/BPR.html)

As shown in figure 4.1, BONAPART developed to cover the needs of expert business engineers and front line managers, presents a foundation for organizational decision making and strategic planning. BONAPART was developed in MS-DOS with Kappa-PC, an object-oriented developing environment from IntelliCorp Inc. (http://www.eil.utoronto.ca/tool/BPR.html)
4.3.1 Hardware and software features

i) System Requirements

BONAPART should be run on at least Windows 98 or Windows NT Version 4.0 or higher with minimum 70 MB free disc space and minimum 64 MB RAM working space.

ii) Integration with Other Programs

Numerous interfaces to other applications are delivered with BONAPART. It distinguishes itself through open data exchange architecture and free component embedding (OLE API, open COM interface, XML data exchange). In addition, the BONAPART OLE Interface includes documentation which enables users to generate extensions to whatever OLE-capable applications they have in-house, insufficient resources or faulty information flows and to estimate process parameters such as time and cost factors. Result profiles, in the form of histograms or protocols, are easily created for each process, sub-process or for any resource or information container. Generally BONAPART is based on its open architecture ideal as Front-End for other applications as shown in Table 4.1:

Table 4.1: Examples of Tools Integrated with BONAPART

<table>
<thead>
<tr>
<th>BONAPART Interfaces to Process-Relevant Solutions</th>
<th>User Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Office Products</td>
<td>Import and Export of complete Data to:</td>
</tr>
<tr>
<td></td>
<td>➢ MS Project</td>
</tr>
<tr>
<td></td>
<td>➢ MS Access</td>
</tr>
<tr>
<td></td>
<td>➢ MS Excel</td>
</tr>
<tr>
<td></td>
<td>Embedding and Linking of any document type via OLE</td>
</tr>
<tr>
<td>Lotus Notes</td>
<td>➢ Linking of documents and databases</td>
</tr>
<tr>
<td></td>
<td>➢ Export of documentlinks to www as local or Web Links</td>
</tr>
<tr>
<td></td>
<td>➢ IntraWare Workflow-Engine (Import and Export complete Lotus Notes Workflows include Runtime Data for Simulation)</td>
</tr>
<tr>
<td></td>
<td>➢ Import and Export Lotus Address book</td>
</tr>
<tr>
<td></td>
<td>➢ Domino Workflow (Import and Export per XML)</td>
</tr>
<tr>
<td>CASE – Computer Aided Software Engineering (e.g. Rational Rose, Select)</td>
<td>Import and Export of functions and data structures from BONAPART</td>
</tr>
<tr>
<td>DMS – Document Management Systems (e.g. Documentum)</td>
<td>Link documents from DMS into BONAPART Models</td>
</tr>
</tbody>
</table>
iii) Multi-User System – Share Knowledge Across the Organization

Through user administration components and simultaneous model access, BONAPART Collaborative makes borderless work within work groups extremely effective. There is no need to continually align model data because all members of the project team have access to the same information. Sub-processes from BONAPART Collaborative can be downloaded into BONAPART Professional for further analysis and simulation or to take advantage of the many interfaces available in BONAPART Professional (e.g. Workflow, Enterprise Resource Planning (ERP) or Case tools).

4.3.2 User features

i) Ease of Use

BONAPART is equipped with a convenient Windows surface and may easily be used by customers who have never worked with such software: Simple user prompting opens up the functions of BONAPART intuitively for the new-comer in optimizing. The ease of use is also supported by a context sensitive Right-Click-Menu with often used commands. Should the user still not know how to proceed: BONAPART Professional offers a context sensitive help. Moreover users can use the BONAPART Wizard, an assistant for first steps with BONAPART. It helps the user create new models with an easy to use chart-function for entering model data.

4.3.3 Modeling Capabilities

Business success lies in the control and optimization of business processes. Regardless of the business strategy, a strategy can only be successful if key processes are carefully planned and executed. Creating competitive advantage in dynamic markets requires extensive internal and external coordination carefully tailored to attain specific
business objectives. Capacity bottlenecks, definition gaps for responsibilities and process rigidity are only three examples of typical management errors. Strategic process management - which is always based on a long-term time span - is required and represents the only way for staff and management to plan work processes in such a flexible fashion that they can be adapted to the constantly changing environment. Process organisation and control in the company are, therefore, not an option but an obligation. In this way, the motto of “continuous change” becomes a management concept that can be implemented.

BONAPORT provides as below:

- **Transparency in Processes and Organizations**
- **Bringing Processes and Organizations to Life through Graphic Visualization**
- **Information Modelling with BONAPART**
- **Individual Layout**
- **Implementation of Documents and Links**
- **Versions - Easy Archiving and Maintenance**
- **Process Comparison with the Delta-Explorer**
- **Comprehensive Object Orientation in Process Models**
- **Integrity and Consistency Verification Included**

**i) Transparency in Processes and Organizations**

With BONAPART, users initiate first steps towards the representation of a transparent company structure. Different scenarios may be displayed by recording elements of the structural and operational organization like Tasks, Function Owners, Material, Information, Quantities, Costs, etc.: -

- Which path should an order take in the company?
- Which persons responsible for a process are available in a company?
Which materials do staff members need for processing information?

ii) Bringing Processes and Organizations to Life through Graphic Visualization

Process modeling with BONAPART is based on depicting the structural and operational organization which is characterized by a pronounced correlation. Required objects of the operational organization like tasks, information, material, memory and media form a business process. In addition, all elements of the structural organization like organizational units, positions and manager are depicted in an organizational chart. The latter may be assigned to the processes as being in charge of individual activities.

iii) Information Modeling with BONAPART

BONAPART displays information models for the development of knowledge management in the company. These can also be imported from other applications like ERP (Enterprise Resource Planning) systems (e.g. SAP). The information is assigned to processes and subsequently evaluated by analysis in BONAPART.

- Which staff member gets which information?
- Which tasks does the staff member handle with this information?
- Which additional information does a staff member need to complete his or her task?
- Where does a staff member store information or from where does he or she retrieve it?
- To whom does a staff member send information?

iv) Individual Layout

To point out dedicated areas in complex models user can use coloured squares, triangles, circles and other geometric forms arranged in a tool bar. Those can easily be inserted by “Drag and Drop” into the model. To differentiate areas in a scenario the user
can insert lines to cover the whole scenario and the system offers the so called Swim-Lane-Design. Numerous styles facilitate the easy and attractive design of business processes. Companies may use their own styles for the preparation of organizational models. BONAPART guarantees that the respective corporate design of customers can be implemented in the models. Users can adapt their organizational models to individual user target groups or depict modeling standards like UML (Unified Modeling Language), EPC (Event driven Process Chains) and Swim lane.

v) **Implementation of Documents and Links**

Arbitrary documents, files or Internet-Links can be added to object for explanation. Those objects are displayed with a paperclip which is used for opening the documents by clicking on it. Furthermore, Lotus-Notes databases, views or documents can be easily added to objects by “Copy-and-Paste”.

vi) **Versions - Easy Archiving and Maintenance**

BONAPART offers the possibility of creating versions of both complete models and individual processes: Model versionizing follows the archive notion so that different versions of a process model are available. For example, the status prior to and after reengineering of a process may be available while the next reengineering is being prepared in the "Changes" model. The new generation version of BONAPART also permits preparing processes with different characteristics that depict processes specific to countries or products. The content of different versions is compared by analysis. In addition, changes are made to existing versions – including the possibility of keeping alternative plans as complete model versions and maintaining them in a sophisticated manner.
vii) Process Comparison with the Delta-Explorer

The Delta-Explorer is available in BONAPART Professional and Collaborative and enables the fast comparison of two processes (variants/versions) or complete models by determination of differences. Thus the Delta-Explorer gives answers to questions as:

- What is different in other countries?
- What is the difference between the actual and the former process version?

viii) Comprehensive Object Orientation in Process Models

The design of process models with BONAPART is characterized by a uniform object orientation, i.e. the alignment to certain defined work processes. Once a class has been modeled, it may be reused again and again. In addition, BONAPART is able to depict all common modeling standards including ERM (Entity Relationship Model), SADT (Structured Analysis and Design Technique) and many more. This consistent model design which allocates different classes (Information, Media, Memory, Materials and Tasks) to the instances (processes or organizational charts) permits uniform information modeling on all levels. For example, the departments of Distribution, Purchasing and Production are instances of the “Department” class. The instances have the same attributes as the pertaining class. Processes which have been defined in this way guarantee complete uniformity and consistency.

ix) Integrity and Consistency Verification Included

BONAPART simplifies the consistency verification. BONAPART checks whether the structure of assignments and processes is identical and has special analysis instruments for this task. For example, users might have organizational charts and the process organization reconciled. As a consequence BONAPART repeats changes automatically at
all other areas in the model if a user changes details of printer that is sorted in the material structure.

4.3.4 Simulation Capabilities

BONAPART Professional offers verification of modeled company processes and the evaluation of different alternatives that includes:

- Process Simulation
- Capacity Bottlenecks
- Optimization of Processes and Resources
- Export Simulation Results to MS Excel

i) Process Simulation

Users are able to assign simulation parameters to each business object of the model as

- Capacities of human and physical resources
- Processing times (including other factors such as resource availability times)
- Assignment of individuals or groups to activities
- Transfer times and information flows
- Input and output conditions
- Direct and indirect costs of people, resources and data processing systems

ii) Capacity Bottlenecks

Simulation is able to analyze processes to check overall performance, identify bottlenecks caused by insufficient resources or faulty information flows and to estimate process parameters such as time and cost factors. Result profiles, in the form of histograms or protocols, are easily created for each process, sub-process or for any resource or information container.
iii) **Optimization of Processes and Resources**

Once a flaw has been discovered in a process, users may run different simulations and compare the results with BONAPART Professional. Alternative scenarios with changed values may be run and assessed according to different criteria as often as required. In this way, the optimum process is found prior to being realized and security is promoted when implementing restructuring measures in a company.

iv) **Export Simulation Results to MS Excel**

To easily summarize them simulation protocols can be exported directly to Microsoft Excel in order to use the diagram assistant for graphical preparation. The number of simulation run is integrated into the protocols, so that users can create individual comparisons.

4.3.5 **Analysis Capabilities**

BONAPART offers subject specific object oriented analyses with multifaceted possibilities to statically and dynamically study enterprise models that can be analyzed on

- time
- cost
- quantities
- qualities

As a consequence consistency and quality of modeled processes can be measured and optimization potentials can be determined through,

- Extensive analysis options
- Analysis results
i) **Extensive analysis options**

There are forty-five standard analysis that maintain model consistency and quality as well as answer common questions such as costs, time, management scope, media breaks, communication structures, etc. An additional 35 user-defined analysis are provided that are easily modified to create any desired analysis.

ii) **Analysis results**

User can export analysis results into a BONAPART table or directly into Microsoft Excel. When using the results as an Excel-File, the user can use the diagram assistant for graphical preparation.

### 4.4 BPR Case Tool III: WebSphere Business Modeler Advanced

WebSphere Business Modeler Advanced is a compact tool by IBM which helps organizations fully visualize, comprehend, and document their business processes. Rapid results can be obtained through the collaboration functionality, where subject matter experts team to clearly define business models and eliminate inefficiencies. The user can model business processes, then deploy, monitor, and take actions based on key performance indicators (KPI), alerts, and triggers for continuous optimization. Business processes then get tightly linked with strategic corporate objectives. WebSphere Business Modeler Advanced can drive much more granular business insight and knowledge, where knowledge equates to competitive advantage. It also bridges the gap between business and IT, providing robust functionality for process modeling, enterprise modeling, essential data and artifact modeling, organization modeling, resource modeling, timeline and location modeling, simulation, and business process analysis. User could understand and transform
their business through superior business modeling, simulation, analysis, and collaboration capabilities (http://www.devx.com/ibm/Door/6836).

4.4.1 Hardware and software features

i) System Requirements

WebSphere requires running in at least a minimum Windows 2000 with service pack 4 or later, or XP with service pack 2 or later, which are the common operating systems used widely with a processor of 500MHz or higher. The hard disk space required is to be 600 MB and installed with 768 MB of RAM (but it is recommended 1 GB RAM) and a minimum of 1024 x 768 resolutions.

ii) Integration with other programs

WebSphere Business Modeler Advanced includes integration with Crystal reports enabling the user to create reports that can combine business process information with additional business information. Once the models have been built, simulated, analyzed, and corrected, the user can deploy them to multiple code generation tools. The models can be exported to WebSphere Studio Application Developer Integration Edition V5.1 through Business Process Execution Language (BPEL), Web Services Description Language (WSDL), and XML schema definitions (XSDs). WebSphere Business Modeler Advanced also supports the capability to export to Rational XDE, under the Business Modeling Profile. Integration with Rational Software Architect (RSA) is performed within the RSA environment by importing the WebSphere Business Modeler process models into the RSA tool. Finally, the tool still supports integration with WebSphere MQ Workflow through flow definition language (FDL). FDL can be exported directly to WebSphere MQ Workflow Build-time.
4.4.2 User Features

i) Ease of Use

WebSphere Business Modeler Advanced, designed to provide an affordable, easy-to-use tool for business users to model, document and print business processes along with complex model simulation and analysis capabilities. With this product, IT users can export models to multiple build-time environments to help jump-start application development. It gives the people who know the business a sophisticated yet easy-to-use tool to model the business, with many drag-and-drop features for process modeling, enterprise modeling, essential data and artifact modeling, organization modeling, resource modeling, timeline and location modeling, as well as simulation. This wealth of industry-leading tool enables user to model precisely, accurately and successfully. It further helps the user to fully understand all aspects of their business models before deploying them, which can increase return on investment.

4.4.3 Modeling Capabilities

WebSphere Business Modeler Advanced offers a flexible, visual-process-modeling environment that is enhanced by the ability to color-code elements according to role, classification or organization units. Along with the name, the user can also add labels to the top and bottom of an object and customize a model so that the appropriate labels can be displayed at the appropriate time. It also includes a “swimlane” view that user can use to display a model according to role, resource, organization unit and classifier. The user can also edit a model in the swimlane view.
i) **Business Modeling**

Business process modeling documents the tasks and workflows of a business process. The first step is to determine the activities, business items, and resources required to execute the process. WebSphere Business Modeler Advanced requires little technical skill, so domain knowledge can easily be turned into a detailed process model. A process model looks like a flowchart. It describes the sequence of steps in a business process (whether they are performed by people or automated systems).

Models are visually described as a sequence of tasks and decisions linked by connectors. A model can contain multiple branching paths based on decisions made during process execution. It also describes the resources available for use in the model and the cost of using those resources. WebSphere Business Modeler also provides a variety of analysis functions that extract targeted information from one or more elements within the model (static analysis) or from a simulation of the model (dynamic analysis).

ii) **Process Modeling**

To make the most of WebSphere Business Modeler Advanced it is important to understand the most commonly used process model elements. These are tasks, decisions, and classifiers.

**Tasks**

Tasks are the basic building blocks representing activities in a process model. Each task performs some function. Visually, a task represents the lowest level of work that can be portrayed in a process. Tasks are atomic actions, in contrast to processes, which may be decomposed into another flow. Cost and revenue estimates can be associated with tasks so that dynamic simulation of the process generates income and expense projections.
**Decisions**

A decision routes inputs to one of several alternative outgoing paths. The user can think of a decision as a question that determines the exact set of activities during the execution of a process. Questions might include: "What type of order?", "How will the order be shipped?", and "How will the customer pay?"

There are two types of decisions: simple decisions and multiple-choice decisions. A simple decision has one incoming branch with one input and two outgoing branches with one output each. When the process is running, the process flow takes one outgoing branch if a certain condition is true and the other branch if the same condition is false. A multiple-choice decision has one incoming branch and multiple outgoing branches. Each outgoing branch has an associated condition (that is, an expression that evaluates to either true or false). This condition determines which branch will be selected when the process runs.

**Classifiers**

Classifiers categorize process elements for analysis purposes. Pre-defined classifiers are provided or user can define his own. Colors can be associated with elements that have specific classifier values, enabling the user to see these values at a glance. User can perform static analysis to see the association between classifier values and model elements in the process. After running a simulation, the user can perform dynamic analysis to find the total cost or duration of elements with a specific classifier value.

**iii) Data Modeling**

Every process model needs a corresponding data model. Data models include the business items, which are the documents, work products, or commodities that are used in the process. Examples of business items are manufacturing orders, mother boards, power
supplies, and memory chips (in a PC assembly process), itinerary and customer information records (in a trip reservation process), and passengers (in a transportation process).

Business items are used within a process to model the objects that are acted on by the tasks and decisions. In addition, user can model a specific instance of a business item. For example, if user has defined a business item called Cash Register, he can model individual cash registers (such as Cash Register #7) as business item instances.

To model the flow of data from task to task, you could associate business items or business item instances with connections between elements in the process model.

iv) Resource Modeling

A resource model is required to accurately model business processes. Resource models represent the people, equipment, or material used to perform a project or a task. Resources are not the same as business items. The objects that undergo changes and are passed from one process step to the next should be modeled as business items, whereas the things that are performing the work or are required prerequisites, such as machines, fuel, vehicles, or skilled personnel, should be modeled as resources.

Each resource is a particular occurrence or example of a resource definition. A resource definition is a set of similar characteristics shared by resources of the same type. If the user has modeled a resource definition called Computer, then some examples of resources might be "Main server," "Web server," and "Test machine 1."

4.4.4 Simulation Capabilities

The WebSphere Business Modeler Advanced simulation engine enables the user to simulate the dynamic behavior of the process, so that the user can analyze workloads and
bottlenecks. By using the simulation engine, user can determine the most efficient model prior to implementation by quickly conducting the "what-if" analysis. User can view analysis on the process, resources, activity and queue during the simulation or after the simulation is complete. WebSphere Business Modeler Advanced animates the flows in a step-by-step simulation that enables you to see real-time data. User can move from the modeling phase to the simulation phase by entering metric information (such as costs and time) into the model while it is modeled in the process editor.

New capabilities in this tool to add and view simulation attributes in a table format help simplify the steps to inserting attributes and running a simulation. New distributions, including Weibull, Continuous, Beta, Erlang, Johnson, and Triangular, support more statistical types of analyses, which are applicable across industries. To support these large simulations and complex distributions, WebSphere Business Modeler Advanced includes usability and performance enhancements so that the user can obtain simulation results faster and store them in a relational database. WebSphere Business Modeler Advanced also has the ability to generate multiple instances of a single resource to faster simulate resource utilization within a business process.

When the user runs a simulation, he can watch an animated view of the process in operation. The animation shows the movement of tokens from the inputs of the process and between activities in the process. A token represents a unit of work that is received by a process and transferred between different activities in the process flow.
4.4.5 Analysis Capabilities

WebSphere Business Modeler Advanced includes a reporting builder that can automatically create written, numerical and graphical reports. The reports provide valuable guidance in the process analysis and redesign. Some of the predefined reports are:

- **Process Summary Report** — provides a single report that contains essential cost and time analysis reports.

- **Process Comparison Reports** — combines and compares the Process Summary Reports from two process simulations for comparisons and provides ROI comparisons of as-is and to-be flows.

- **Documentation Report** — provides an overview of the attributes of business items, resources, or other model elements.

- **Procedure Report** — documents the sequence of steps within a process, and the relationships of that process to other processes and roles.

These reports also deliver a detailed weighted-average analysis to validate and optimize the processes that user has defined. User can improve his business by understanding the time and cost performance of the processes. If user needs a customized report, the report builder can help to generate it. Or user can publish models to the Web using WebSphere Business Modeler Publishing Server. Then, subject-matter experts can collaborate by viewing and commenting upon these models using a standard Web browser. Integration with Crystal reports enables the user to combine business-process information with other critical reports or supporting documentation that is relevant to a particular process.
Dynamic analysis lets user to extract targeted information based on the results of the process simulations. WebSphere Business Modeler supports four primary types of dynamic analysis:

- **Aggregated** - Determines information about activities and resources used in all process instances generated during a simulation.
- **Process instance** - Performs a summary analysis to show process results for activities within a particular instance of a process that is created during a simulation run.
- **Process cases analysis** - Shows statistics produced by all process cases in a simulation.
- **Process comparison** - Compares the weighted average analysis results for two simulated processes that use the same input parameters.

Each type of dynamic analysis offers numerous reports that can be generated at the click of a button.

### 4.5 Summary

Based on the analysis done on the three tools, it is found that the tools have their own advantages and disadvantages. BONAPART does not require high system requirements but SmartDraw and WebSphere Business Modeler do require a minimum operating system at least Windows 2000 and at the same time it requires high resolution.

SmartDraw is the most user-friendly and very cooperative with the creator among the tools analyzed. Organizational charts are the best way to visualize and understand the workforce; this can be done easily in SmartDraw. It’s intuitive; easily exports for posting.
on a web site, drawing corporate history charts and able to produce drawings within a
couple of minutes with its extensive symbol library and templates. Moreover it’s very
flexible for simple flowcharts. All three tools have help features in order to assist users to
utilize the tool efficiently. In BONAPART, the graphical user interface under Windows
makes the system simple and convenient to operate. The graphical display of the models
enhances comprehension. In WebSphere Business Modeler, business managers and
business analysts can more easily design and develop process flows that improve the end-
to-end business process. The people with the in-depth knowledge of the business processes
themselves are able to use the tools to maximize their business effectiveness by optimizing
processes in a complex environment. BONAPART and WebSphere Business modeler are
considered more comprehensive tools.

BONAPART and WebSphere Business Modeler could provide a good modeling
support whereby SmartDraw appears more suitable for direct flow chart where BPR is only
one part that can be utilized here. In corporate model, the relevant structural information is
standardized according to the BONAPART method and depicted in graphical view. For
example the tasks to be processed are represented in function models, and the data flow in
information models. Based on the abstract models created, the organizational structure is
then represented in organization charts and the process structure in process models. When
the user creates models, he can freely define relations and characteristics to describe objects
that he requires. WebSphere Business Modeler could capture, store, and share important
organization information in a common database, or repository and then create an accurate
representation of the factors that shape each outcome of the business processes. User could
review business processes in cascading detail levels - from a high-level summary view
down to granular detailed tasks.
For simulation, BONAPART would be the best tool to be used whereby WebSphere Business Modeler does provide medium support. Simulation is an important aid in developing target models. Since BONAPART incorporates the dynamic aspect, realistic optimization of the corporate model becomes possible. In addition to this, complex changes in the corporate structure can be tested without the sizable investment that reorganization would require. Its simulation capability is very effective in studying the process efficiency, resource constraints etc. Hence it can be used as an effective tool for work flow analysis. WebSphere Business Modeler simulates how user’s new processes will perform with a variety of environmental factors, such as time and cost, so that user can project outcomes before implementation. The simulation capability in WebSphere also aids in doing Scenario and what-if analysis.

BONAPART really emerges as a tool for actively managing processes since it provides a good analysis support while SmartDraw and WebSphere only provide medium support. In BONAPART, it’s very comfortable to analyze a process with visuals and it is easy to understand too. The flexible object-oriented Analyzer represents a powerful instrument for statistically and dynamically analyzing the corporate model and for modeling target structures.

SmartDraw is more focused in providing good integration where the flow charts that have been created could be converted to many other files such as Microsoft Excel, while the other two tools do support this facility to a small extent. Overall BONAPART has been found to be a more suitable tool to be utilized in BPR processes. Table 4.2 below shows the comparison of these three case tools.
<table>
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<tr>
<th>No</th>
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<th>BONAPART</th>
<th>WebSphere Business Modeler</th>
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<td>Good, Has good help features</td>
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<td></td>
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<td></td>
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<td>* built-in hints</td>
<td>* provides convenient</td>
<td>* Compact tool</td>
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<td>* familiar interface</td>
<td>windows surface</td>
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<td></td>
<td></td>
<td></td>
<td>* considers non-</td>
<td>* Context</td>
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4.6 Conclusion

A thorough analysis had been done on the three existing stand alone case tools which are SmartDraw, BONAPART and WebSphere Business Modeler. This analysis had helped the researcher to discover the five basic features that a BPR case tool should have and an understanding of the attributes required was derived. This will be discussed further in next chapter.