White Paper
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Introduction to Vicinity

Vicinity software is developed and maintained by Vicinity Manufacturing Corp (Vicinity Manufacturing) and is written to address the specific requirements of process manufacturing companies. These companies can include chemical, paint, coatings, fragrance/flavorings, food or any other company that utilizes formulas in their production process.

Vicinity Manufacturing was founded by a limited number of investors who each have significant experience in the process manufacturing sector as implementers, programmers and resellers of software. The software development, sales and implementation expertise of the owners of Vicinity Manufacturing is impressive and biographies are available upon request. Corporate offices are located in Atlanta, GA with sales and development offices in Chicago, IL and Los Angeles, CA.

Vicinity software was developed to serve the vertical market of process manufacturing that up to this time was primarily serviced by large mid-range solutions or converted discrete applications. Although there are a few other PC based applications in the market space none were developed with the intimate understanding of the market place or with the technology infrastructure available from Vicinity software.

To understand the vision of Vicinity it is important to understand the process manufacturing sector and what makes these companies unique to other manufactures. In addition, it is important to understand the unique way Vicinity has chosen to structure the product, its features and role-centric user interface. These topics will be covered in the remaining document.

Process Manufacturing – an overview

Process manufacturers share certain key similarities to their discrete cousins. Unfortunately these similarities often overshadow the most important differences between the sectors. As a result many software developers often "modify" their discrete application to fit into the mold of process manufacturing. The result - the application does 75% of what the process manufacturer needs but the remaining 25% costs the company 80% of their processing efforts.

It is important to identify some of the key differences between process and discrete manufacturing companies.

Bill of Material (BOM) vs. Formula – Discrete manufactures convert raw materials to finished goods by using a Bill of Material. This listing of raw materials identifies the required items to manufacture one finished good. The BOM is related to a specific finished good.

A process manufacturer will speak in terms of a formula. Like a BOM a formula lists the raw materials needed to manufacture the product. However unlike a BOM, this formula is not specifically tied to only one finished good. It is often the case that the same formula will be used to produce more than one finished good. An example of this is a company that makes shampoo. The company will manufacture the same formula and fill the product into various bottle sizes or packaging configurations. Each of these different products would be stocked as a unique finished good.

A discrete application will separate the production run into at least 2 work orders. The first work order would be to manufacture an intermediate/sub-assembly and place this product on hand. The second step would be to use some of the sub-assembly to fill a specific finished good. Each containerization would require separate bills of material and yet additional work orders to perform the task.

Process manufacturers do not work in this model. They will generate one batch ticket to generate the formula and then specify the containerization needed to finish the production. One batch ticket will often yield more than one finished good from the same production run. This is typically not possible with discrete manufacturing applications without the generation of various work orders to support various packaging requirements.

QC testing – Process manufactures will perform a variety of tests during the production process but will not typically need to perform testing dependant on the batch size. Discrete manufacturers will calculate specific sample sizes depending upon the size of the production run. They will perform the appropriate tests and reject the production run if the results are outside a tolerable limit. Process manufacturers instead will perform the tests, record the results against the production run and modify the batch in process to yield an appropriate result.

Therefore, the QC tests for a process manufacturer are used not only to test for applicable results but also recommend modifications to the production in process. Each of these results must be documented electronically with the batch ticket for later regulatory reporting.

Unit of measure – It is typical for a process manufacturer to alternate between various units of measure for the same raw material or finished good item. It is common for a process manufacturer to assign weight, volume and each to most raw materials and finished goods. For example water can easy be measured in both gallons/liters and pounds/kilos. The difference between these units is often measured in terms of density, specific gravity or bulking factor. Discrete applications will often setup a standard conversion factor for all items – pounds to kilos is a good example. The weakness in this design is that there are other units of measure – pounds to gallons – that are item specific. Many discrete applications are not able to address this issue.

Additionally, it is important for any item to support multiple units of measure for costing purposes. It is common to require a cost per pound as well as cost per gallon throughout the system. So although a system might offer a unit of measure conversion for stocking purposes it also needs to extend to all reports as well as all user interface screens.

Lot tracking – Process manufacturers track lots from raw materials through production and out the door as finished goods. These lots need to determine who supplied the lot, the remaining quantity and other attributes as assigned. These attributes will include expiration dates, effective dates and lot strengths. Each of these elements work to assist a process manufacturer in determining when and for how long a lot is available as well as the affect a particular lot will have on the production process. It is not typical for a discrete manufacture to alter the production process due to the lot characteristics as will occur for a process manufacturer. A process manufacturing application will take characteristics of a given lot into consideration in the calculation of the formula required for a particular result.

Hybrid manufacturing – It is common that many process manufacturing companies are actually a hybrid of both process and discrete manufacturing. The process elements are evident in the mixing/blending operations that take place at the beginning of the manufacturing process. Once the mixing operation is complete some process manufacturers take the bulk product to one or more filling lines for packaging. These filling operations have some characteristics of a discrete organization. They will talk in terms of a Bill of Material and will produce units measured in each (bottles, cases or drums). Therefore a truly good process manufacturing application will address the unique issues of a process manufacturer through the compounding stage and then be flexible enough to address the discrete elements in filling.

Above are only a few of the key differences between process and discrete manufacturers. There are dozens of other examples outside the scope of this paper. An application written for a discrete company typically will not meet the primary requirements of their

process counterparts and will consume significant resources attempting to meet even the basic requirements of this diverse industry.

Vicinity and Process Manufacturing

Vicinity software was written for process manufacturers. The developers of this application only have this sector in mind to service. The application utilizes a master formula model allowing the company to assign the same formula to various finished goods. Additionally, it is possible to assign different formulas to the same finished good. This is important when one facility has access to different raw materials than another facility but they both yield the identical finished good.

Vicinity tracks lots and utilizes the lot characteristics in production planning and control. This allows the company to alter a production formula dependant on the characteristics of the lots available – saving time and adding efficiency to the production process.

QC tests are assigned at the formula level as well as the finished goods level. This allows certain tests to be performed whenever a formula is created and different tests to be run for the packaging of the finished goods. Both QC tests are required for adequate testing and compliance of the production process.

Vicinity allows an unlimited number of units of measure to be established for any raw material or finished good. This allows the user ultimate flexibility in identifying products and reporting requirements and results of operations. All this done to facilitate a streamline production flow from order processing into production and out as an invoice.

Vicinity mixes the best of both process and discrete manufacturing for a well rounding application that can easily address the common elements typically found in hybrid process manufacturers. In addition to the unique process features Vicinity has added Bill of Material functionality for the filling operations as well as a multi-level routing model to assist production control manage and track production through the various stages of completion.

For more features specific to process manufacturing see the detailed user guides or see your local Vicinity representative for a demonstration.

Roles based development

Vicinity manufacturing developed Vicinity software by identifying the key roles people play within a process manufacturer. Once the roles were established business objectives were identified for each role. Finally business rules were established to define how the objective was to be carried out.

For example: in every process manufacturer there is someone who develops new formulations. This person performs tasks such as generate a new formula, identify new/existing raw materials for the formula, analyze preliminary test results, modify the preliminary formula and propose key QC tests to perform while in production. This role is called the Product Developer in Vicinity software.

Vicinity software was written with these roles in mind. Every effort has been made to optimize the user interfaces to keep critical business information at hand. Additionally, time saving features have been added to allow the user to efficiently and accurately perform the task at hand. Vicinity software allows the user to perform the job easier, faster and more accurately.

The following roles and business objectives were identified:

Implementer – Person responsible for installing the software, initializing databases, configuring workstations and maintaining master setups. Vicinity is designed to make their life easier by utilizing a .NET platform thereby minimizing the installation complexities, maintaining all the databases in SQL server and centralizing all application setup routines for easy access. Upgrades are a snap as there is no reason to install anything on the client workstations. It takes the same amount of time to upgrade one workstation as it does 1,000.

Product Developer – Person responsible to create new components (raw materials, packaging and finished goods) as well as setting up formulas and QC tests for later production. This role defines the production process and assists the production controller to ensure the most efficient method of manufacturing is utilized. Vicinity centralizes the tasks for this role allowing all functions to take place from a very few number of screens. In addition, the product developer can work on experimental raw materials, finished goods or formulas without the risk of others inadvertently producing product that has not yet been approved. Lastly, Vicinity allows this role to establish standards on a facility basis. This is important because not all facilities will manufacture the same product using the same raw materials or processes. With Vicinity all these items can be setup and maintained on a facility basis – allowing ultimate flexibility at the plant level.

Production Controller – Person responsible to ensure that the production schedule is adhered to while generating the finished goods at the most efficient manner possible yielding the appropriate quality finished good product. Vicinity allows for

efficient data collection of raw material usage, finished goods production and QC test results. Additionally, by utilizing .NET Vicinity can easily accept results electronically from other system further adding to efficiency and reliability. In short, Vicinity removes much of the clerical function and allows the Production Controller to perform the job of managing production.

Production Scheduler – Person responsible to developing an attainable production schedule by reviewing dependant (sales orders) and independent (forecast) demand, machine capacity and raw material availability. Vicinity assists this role by displaying source demand and the existing shop floor schedule to pinpoint available capacity by facility and/or machine. This allows the production scheduler to maintain an accurate schedule with real time updates of actual production against the proposed schedule. Once the schedule is established, Vicinity utilizes standard MRP policies to report purchasing requirements and potential shortages that require human intervention. Vicinity supports the supply chain to buffer potential production interruptions before they become real issues that might alter the schedule on the production floor.

Compliance Officer – Person responsible for regulatory compliance for the organization. Vicinity assists in the SARA reporting as well as other regulatory compliance requirements – including MSDS and Dot regulations. Because all data is stored centrally the compliance officer can report information at a facility or organizational level – all without leaving the office. Vicinity allows this valuable resource to move from a role of reporting to a role of analyzing to a role of facilitation.

Quality Control – Person responsible for identifying, reporting and correcting quality issues at an organization. Vicinity assists this role by establishing standard tests to be performed at the raw material, formula and finished goods level. In addition, test instructions can be assigned for each QC test allowing more standardization in the testing procedures for the organization. Additionally, all test results are recorded against a production batch or lot number allowing full traceability of QC results through the life of a product. Vicinity assists this role in identifying lots that are approaching the expiration date and will not allow unapproved lots into production. These features and many others allow the Quality Control role to be more empowered to assist the overall production process of an organization.

Operations Analyst – Person responsible to review the overall operations of the business. Vicinity provides accurate, efficient and timely review of the results of key operations for the company. This data can come from production results by formula or finished good, productivity by facility or machine as well as labor utilization by shift. All of this data is available from the machine, production line, facility and organizational level. Vicinity begs the question – how much did we make, what did it cost and how can we do it better.

Each of these roles plays a significant part in the development of Vicinity software. It is with these roles that a well rounded, richly conceived and timely application was founded. You will see evidence of these roles in your first moments with Vicinity from the menu system to the screen layout – Vicinity understands how a process manufacturer does business.

ERP Integration

Vicinity software is design to address the manufacturing needs of process manufacturing companies. With this in mind a strategic decision was made to rely completely on the distribution modules of other applications for inventory control, purchasing and order entry.

Vicinity reads data natively from various ERP applications and extends these rich and robust distribution applications to fit the unique needs of process manufacturing. All inventory items reside in the ERP application's inventory system where quantity on hand and lot availability is maintained. Vicinity tracks manufacturing specific information as needed through the life cycle of production. All this is done with little overhead by the users.

In adopting this model Vicinity immediately inherits all vertical integrations previous written to interface with the ERP application. Examples include: bar coding, web storefronts, point of sale, sales forecasting and customer relationship management.

While other process manufacturing applications have chosen to write their own distribution modules – Vicinity has chosen to extend the already powerful offerings of the most popular systems in existence today.

For a complete and up to date list of those ERP systems that Vicinity integrates, see your local representative of Vicinity software.

Application Architecture

Vicinity software is written on the .NET framework and written using C# against a SQL 2000 database. All processing occurs through extensive use of web services and XML data packets.

Because of this architecture, deployment is a snap. The application is hosted on an application server that may or may not host the SQL Server databases. All that is required at the workstation level is the appropriate .NET framework for the workstation's operating system. Once this is installed the application is ready for use.

Upgrades require only a copy of modified DLLs to the server folders. Once this takes place, all workstations are simultaneously affected. No more need to visit each workstation to rollout a patch.

Remote access is possible within the .NET framework. With appropriate bandwidth it is possible to run Vicinity across the internet allowing the user access from anywhere in the world. This is accomplished because all data packets are sent as needed rather than requiring the entire set to be transmitted with each request. Additionally, once the data has been transmitted the .NET framework will determine if a refresh of the workstation data is required. The result is less traffic on the communication backbone and less calls to the host server.

All reports are written in Crystal Reports and are fully modifiable by the users to localize the reports to their specific requirements. Additionally, all reports can be hosted on the web for further extendibility of vital data to trusted parties.

In short, Vicinity is written with the most current technology available today with the intent to provide the most robust work environment affordable today.

Frequently Asked Questions

Why did Vicinity Manufacturing write Vicinity?

Vicinity software was written to fill an under serviced sector in the process manufacturing industry. Existing applications were written on older architecture and on relatively outdated databases. It was time for a new paradigm to be established using a fresh look at the market and its customers within this sector.

Who is the target market for Vicinity software?

Vicinity software is written for formula based manufacturers or distributors of regulated chemical or food products. Its attention to regulatory details and robust batch processing features leads Vicinity to be a significant player in that market. A typical client will range from startup laboratories to large multi-national organizations. The average client will be from $5 million to $250 million in annual revenues or divisions of larger organizations.

Why did Vicinity Manufacturing choose .NET?

.Net offers tremendous development advantages. All Vicinity software applications are written using C# and the data is stored on MSSQL server 2000. This allows Vicinity Manufacturing developers to develop and deploy feature rich applications much faster than traditional means. Additionally, all significant processes are hosted by a web server allowing other applications to access the Vicinity routines from within their own applications. For example, it would be rather easy to write a link to the Vicinity MRP application to run a single item MRP calculation and return the results to the requesting software. This savings allows Vicinity to produce more feature rich applications and maintain high levels of quality well into the future.

What ERP applications does Vicinity support?

Currently Vicinity software integrates to Microsoft Business Solutions' Great Plains and Solomon. The primary reasons for this choice lie in the strength of the ERP distribution applications. It is critical that the selected ERP systems can adequately provide infrastructure for lot tracking, unit of measure and complex price structures. It is also important that the distribution suite allow for customization of the user interface screen. This allows Vicinity to extend custom functionality into the ERP suite as needed.

How can I purchase Vicinity software?

Vicinity software is available for purchase through the authorized reseller channel. This group of professionals is certified to demonstrate, sell, implement and support Vicinity software. If you are not in contact with such a reseller just contact Vicinity Manufacturing and a reseller will be provided to you.

How much does Vicinity software cost?

Vicinity software is licensed for use on a concurrent user basis. That means that multiple workstations can be configured to utilize Vicinity software but only count as a user while they are actually using the application. User pricing is based on the ERP application that it is integrated with and varies from $2,000 to $6,000 per concurrent user. The number of concurrent users varies from company to company but typically approximates 1 user for each 5 ERP (Distribution and Financial) users in an organization. For the smaller companies entry level pricing is available for as little as $5,000.

Who will provide training on Vicinity software?

Vicinity software resellers and/or consultants are authorized to provide implementation services. These services are contracted separately with the consulting organization. Vicinity Manufacturing can provide the name of an authorized consultant upon your request.

Who will provide support after I implement Vicinity software?

Support is available directly from Vicinity Manufacturing or directly from the Vicinity software reseller upon completion of the implementation. Vicinity Manufacturing provides email and phone support as a part of the annual software maintenance plan.