



White Paper

Integrating External Ordering Systems with Restaurant Point of Sale Systems

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Website: www.LoneTreeTechnology.com

Email: Info@LoneTreeTechnology.com

PO Box 630735
Highlands Ranch, CO 80163-0735

Phone: 720.482.7823
Fax: 720.482.7861

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A White Paper: Integrating External Ordering Systems with Restaurant Point of Sale Systems

This paper discusses the challenges of integrating External Ordering Systems such as Internet Based Ordering Systems, Calls Centers, or Self Service Kiosks to Restaurant Point of Sale systems. The XML Order Interface, a product of Lone Tree Technology, Inc., is described and discussed as an aide to integrating external systems to restaurant point of sale in either the online ordering, call center or kiosk environments.

The Challenges of Developing Online Ordering Solutions

As the Restaurant Industry continues to modernize, Restaurateurs are seeing a substantial return on investment on Point of Sale systems to manage sales, labor, and kitchen activities. Point of Sale systems (POS) are a critical element in maximizing efficiency within the facility. Their presence may also allow new ordering methods not previously available such as via Self Service kiosks, Internet Based Online Ordering Systems, or Call Centers. The advent of such systems typically allow the Restaurateur to gain new revenue streams without the typical investment in more real-estate or additional staff. However, to achieve this goal, several challenges must be overcome, as described below.

Low Level POS Integration Challenges

To make it possible for a Restaurant Point of Sale System (POS) to receive orders electronically from an external source, the POS must either natively offer this type of solution or allow an external software application to be able to insert or inject orders into the POS order stream. Not all POS systems provide this. Radiant System's Aloha POS allows external software interaction via Microsoft Component Object Model (COM) Automation, which allows a systems integrator to insert an order into the POS system. While this general methodology provides a very high degree of control to the system integrator, it will also require integrators to develop a high degree of expertise in POS operation to achieve a reliable solution that is capable of handling various operational contingencies. This expertise is specific to each POS system, with little or no overlap between POS Manufacturers.

Business Rule Compliance

Modern POS systems enforce flexible ordering business rules. These rules ensure each order is correctly taken as specified by the Restaurateur. The business rules for each item on the Restaurant's menu may be similar for most items, or may vary dramatically. For example, the simple process of ordering a soft drink may require the Order Taker to specify two important attributes of the drink: Drink Size, and Drink Flavor. Ordering a Steak Dinner is a far more complicated process, requiring the POS to enforce a set of rules defined by a decision tree. This decision tree not only affects how the item is prepared, but ultimately how much the item will cost. These business rules may be updated frequently, possibly weekly or even daily. External Ordering Systems must account for and obey these rules when placing orders on the POS or the request items will be rejected by the POS. This is a considerable challenge for any external ordering system.

Business Rules Extraction

Orders placed electronically must also comply with these same business rules. This implies that any external ordering solution must have knowledge of the same business rules. This is a considerable challenge with any POS system, as the layout and organization of the business rules are intended for internal system use. Successful extraction of Business Rules in a form that can be automatically updated and acted upon by the external system requires the System Integrator to become intimately familiar with the POS System operations, limits, structures, and constraints. The integrator then needs to develop an understanding of how these rules are specified in the POS file system so that the data can be extracted and finally organized into a set of business rules that can be used by the external ordering system.

XML Order Interface – Simplifying POS Systems Integration

The XML Order Interface developed by Lone Tree Technology, Inc. is a robust, feature rich middleware software solution that greatly simplifies external order systems development and integration with the Aloha POS. The XML Order Interface eliminates the need for the systems integrator to gain knowledge about the Aloha COM interface. The XML Order Interface also eliminates the need for the systems integrator to develop substantial Aloha POS expertise. The XML Order Interface provides the system integrator with an XML version of the POS system menu, encapsulating all item ordering business rules. Additionally, the XML Order Interface provides a variety of communications options which further simplifies the process of getting an order placed in a timely order on the POS onsite.

Theory of Operation

The XML Order Interface is a software solution that resides on the POS file server. The application operates continuously, periodically checking all configured input channels for orders. In a typical configuration, the XML Order Interface queries a specific URL via HTTPS with a Site-Id parameter (indicating which restaurant is making the request). If the URL responds that orders for the site are available, the XML Order interface checks the status of the POS system to insure that it is ready and available to accept orders from an external source.

Orders take the form of XML documents. The documents, called POS Requests, may contain 1 or more orders to be placed on the POS System (example follows).

```

<POSREQUEST EXTTERMID="001" EXTREQUESTID="1234" REQACK="Y">
<CHECKREQUESTS>
<ADDCHECK EXTCHECKID="Johnson/123" ORDERMODE="2" NOTE="READY AT 12:45PM">
<ITEMREQUESTS>
<ADDITEM ITEMID="4210" QTY="2" ORDERNOW="Y">
<MODITEM ITEMID="20680" QTY="1" MODCODE="1" />
<MODITEM ITEMID="21250" QTY="1" MODCODE="1" />
<MODITEM ITEMID="20720" QTY="1" MODCODE="1" />
<MODMOD ITEMID="51230" QTY="1" MODCODE="1" />
</MODITEM>
<MODITEM ITEMID="20785" QTY="1" MODCODE="1" />
</ADDITEM>
<ADDITEM ITEMID="9110" QTY="1" PRICE="1.25">
<KITCHENMSG>NO ICE</KITCHENMSG>
</ADDITEM>
<ADDITEM ITEMID="9110" QTY="1" />
</ITEMREQUESTS>
<CONTACT FIRSTNAME="Rob" LASTNAME="Johnson" COMPANY="Lone Tree Technology" DEPT="S/W Dev" PHONE1="720-482-7823 Ext 1" PHONE2="303-555-1212" EMAIL="Info@LoneTreeTechnology.com" />
</ADDCHECK>
</CHECKREQUESTS>
</POSREQUEST>

```

Figure 1 - Example POS Request

Upon receipt of the order, the XML Order Interface software proceeds to place the order in the POS as if entered by a human user as a regular POS terminal. The order is accessible via the POS terminal by authorized users. Any activity in the POS that would normally occur when an order is placed by a human user, such as kitchen chits printing at selected printers and kitchen video displays being updated with new items on the guest check, occur as they should at the appropriate time and place, as configured in the POS system.

After processing the order, the XML Order Interface creates a Response document for use by the external ordering system (example follows).

```

<POSRESPONSE EXTTERMID="001" EXTREQUESTID="1234">
<CHECKRESPONSES>
<ADDCHECK SYSTEMERRORS="0" ITEMERRORS="0" TENDERERRORS="0" EXTCHECKID="Johnson" INTCHECKID="10022"
POSCHECKSUBTOTAL="10.10" POSCHECKTAX="0.71" POSCHECKTOTAL="10.81">
<LOGS COUNT="1">
<LOG TEXT="06/07 11:10:11 External Order ID:Johnson - Aloha Check ID:10022" />
</LOGS>
<DEBUGS COUNT="0" />
<ERRORS COUNT="0" />
</ADDCHECK>
</CHECKRESPONSES>
<PRINTRESPONSES />
<ERRORS COUNT="0" />
<DEBUGS COUNT="2">
<DEBUG TEXT="06/07 11:10:11 D3: INITIALIZING ALOHA INTERFACE." />
<DEBUG TEXT="06/07 11:10:11 D3: ALOHA INTERFACE INIT COMPLETED." />
</DEBUGS>
<LOGS COUNT="0" />
</POSRESPONSE>

```

Figure 2 - Example POS Response

The Response document contains all the information previously captured from the check. In addition error, debug, and log messages may also be included for processing by the external ordering system. Such failures as "Credit Card Declined" would most likely require immediate action by the external ordering system.

Features of the XML Order Interface

The XML Order Interface is a feature rich middleware solution. The following feature sets are available.

Guest Check Creation

The core functionality of the XML Order Interface is the creation of new guest checks within the POS. The software can add the following information to each guest check:

- 1.Name the Guest Check, such as “John Smith” or “Jones 12345”
- 2.Add as many items to the Guest Check as the POS System allows (typically 250+)
- 3.Support for “N” (infinite) levels of item modifiers
- 4.Support for using either supplied price or POS price for items
- 5.Support for applying free form messages about each item
- 6.Ordering items by Item, by Check, or Both

Check Tendering

The POS Request document allows the external ordering system to specify one or more tenders for the Guest Check. Any Credit Card supported by the POS may be used. The system fully supports credit cards, using the POS system to natively process the credit cards. (This means that the POS will itself process the credit / debit card through its own process.) Tender usage will show up correctly in all POS reports. The POS Request document allows the specification of the Credit Card number and Expiration date.

Menu Extraction

One of the most powerful features of the Lone Tree XML Order Interface is its menu extraction facility which provides a structured XML document of the POS system menu. The document encompasses all the business rules required for ordering each item on the menu. The following components of the system menu are extracted:

- Store Address information
- Sub Menus (with item prices if included)
- Categories
- Items (Price, Short/Long Desc, associated Modifier Groups, Tax ID)
- Modifiers and Modifier Groups
- Order Modes
- Taxes
- Price Levels

The Menu Extraction facility is designed as an “on-demand” feature of the system; the current menu can be requested at any time. Each menu includes the Date of Business that the menu was created.

The Menu Extractor also allows the specification of menu filters, either by Category or Sub Menu, which allows the systems integrator to select items based on item group association.

Custom Printing

The XML Order Interface allows the system integrator to handle custom printing solutions on the POS in a variety of ways. For the Aloha POS, a customizable Delivery Ticket is available for use with delivery orders (the Aloha Delivery System is not accessible via external software systems). In addition, the XML Order Interface supports the creation of custom chits or ordering documents as needed; these documents can be printed via attached POS printers via the POS system, or via windows printers available on the local area network.

There may be a need to reprint custom documents. If this is needed, the XML Order Interface can be configured to reprint custom documents via the POS Server system.

Order Pricing

A special feature of the XML Order Interface is the ability to price an order. Typically used with the POS Web Service communications option, this feature allows an external ordering system to submit an order to the POS to get the price of each item plus the check subtotal and tax without actually submitting the order to the kitchen. This feature allows external ordering systems such as call centers or self service kiosks to verify pricing in real-time.

Communications Options

The XML Order Interface provides several different communications options with External Ordering Systems (see following diagram):

- Polling Model – The XML Order Interface can poll any URL via HTTP or HTTPS at a configurable time span, typically once per minute. This model is popular with Internet Ordering solutions providers as it allows the external ordering system to utilize the polling request as a “system heartbeat”, indicating that all components of the Online Ordering System are communicating on a regular basis.
- Web Service – A web service option is available for use with the XML Order Interface. This solution may be desirable in call center environments or other online order solutions where pricing requests are needed and/or heartbeat checks are deemed unnecessary or redundant. When using this solution, an internet web page server such as IIS is installed on the POS server. The POS Web Service software is installed in the IIS directory structure, and processes external requests by immediately passing the POS requests to the XML Order Interface, which responds back with the POS Response document.
- File System – POS Request and Response documents stored on a file system attached to the POS Server can be utilized by the XML Order Interface. This solution may be desirable for self service kiosks.

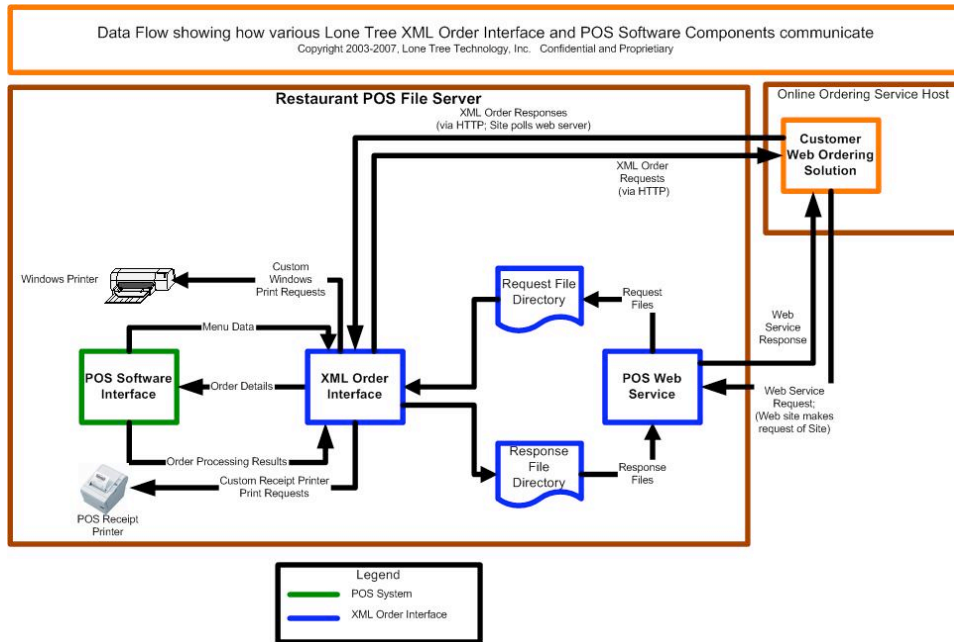


Figure 3 - Communications Options

Security

As data security is of utmost importance, the following practices are followed:

- In normal operating mode, the XML Order Interface does not store any data on the hard-drive of the POS Server; all data received from the external ordering system is passed onto the POS and then expunged from memory.
- The XML Order Interface is deployed with a configuration program, which is password protected. Configuration files are encrypted utilizing a 128 Bit encryption algorithm.
- POS Requests received from the External Ordering System are received by the XML Order Interface in encrypted form. The XML Order Interface knows how to decrypt the data, but not encrypt it. The External Order System is responsible for encrypting the data. Lone Tree Technology provides the External Ordering System provider with a software component which performs the encryption of the XML using an algorithm that employs a minimum of 128 bit encryption methodology.

Benefits of the XML Order Interface to Systems Integrators

The XML Order Interface provides a number of benefits to systems integrators or applications developers:

- Straight-Forward Integration – Using industry standard communications protocols, the XML Order interface greatly simplifies POS integration with external ordering systems.
 - The need to gain any knowledge of the Aloha COM interface is eliminated.
 - The need to developed substantial POS expertise is eliminated.
- XML Version of POS Menu – The XML Order Interface provides a straightforward way of capturing all item ordering rules by capturing them in a single XML document that can be requested on the fly.
- Stable, Field Proven solution – In extensive deployment since 2004, the XML Order Interface is currently in use in a wide variety of dining environments. The software is field tested, stable, and proven across numerous Aloha POS versions.

Learning More

To learn more about the Lone Tree XML Order Interface, go to our website at www.LoneTreeTechnology.com