



Automotive Aftermarket
Industry Association

**AAIA i-SHOP STANDARDS FOR THE INTEGRATED AUTOMOTIVE SERVICE
and REPAIR SHOP**

i-SHOP Technical Overview

.03

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i•SHOP Technical Overview
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1. Introduction

Thank you for your interest in the i•SHOP connectivity standards. At AAIA we believe these standards represent a monumental step forward for the industry, benefiting the end user of the equipment as well as the companies developing product for the Automotive Industry.

This document is designed to give you an overview of i•SHOP so that you are armed with the information you need to decide if i•SHOP is right for you.

The overall objectives of the system are discussed, as well as a technical overview and implementation steps. Finally, contact information is provided as well. Please feel free to contact us if you have further questions regarding the standard or “next steps” to get more involved.

2. Objectives of i•SHOP

Most simplistically, the objectives of i•SHOP are to create a standard communication architecture that enables an Integrated Shop. Therefore, it is appropriate that we define here what an integrated shop is:

- An Integrated Shop can share information about the customer, the vehicle, the work order, work performed and test results between the shop management system and all diagnostic test equipment and information servers.
- An Integrated Shop can send and receive any existing data without the need to re-key...from any work station.
- An Integrated Shop Environment enables the shop owner/manager to select the best equipment and systems to meet their needs without concern for compatibility.

The end result of supplying an Integrated Shop Environment is:

- More satisfaction for the customer.
- More efficient for the technician.
- More profitable for the shop owner/manager.
- More selling opportunities for the equipment manufacturers.
- A better investment for the industry.

The following pictorially represents i•SHOP's vision of an Integrated Shop:



While today i•SHOP focuses on the internal network within the back-shop and front-shop networking environment, we are already beginning work defining the interface to the Internet and associated technologies. Also, while i•SHOP currently is concentrating on North American companies, we have agreed with the European community to join forces and work with them to create an information gateway to the European connectivity standard, Asa-net, which will further our connectivity in the global marketplace.

3. Why i•SHOP?

There are several reasons for partnering with the i•SHOP standards community:

- Increase your Customer Base and improve existing Customer Satisfaction. By joining the i•SHOP connected community of products, you open a new range of services for your customer. Allowing connectivity from the Front Shop to the Back shop reduces time/errors in multiple keying of customer/vehicle information, allows creation of reports at a single point, and will ultimately expand to allow the service technician access to parts ordering and enhanced communications with the front shop. As the Member Companies market their products as i•SHOP compatible, they will “by-design” have a competitive edge over the companies that are not part of the Standard. Customers will feel comfortable when they purchase that the equipment is capable of the featured i•SHOP provides, even if they choose not to implement the functionality at time of purchase.
- When you join the i•SHOP community, you’re in good company! This standard is endorsed by some of the most respected names in the automotive equipment, information and software industries. As mentioned previously, we also have an agreement with the European standards community to ultimately connect the networks together to increase global connectivity. The foothold this standard has on the marketplace gives this standard credibility in the eyes of shop owners, from large National Accounts to single-bay repair facilities. You will have the opportunity to access sample source code and share in the discussion with the technical community as you implement the standard in your equipment. To you this means less investment and faster-to-market than if you designed the communications framework independently, and far less cost to maintain and enhance the system. This frees up your development resources to concentrate more on the key features and functionality of your product, without worrying about partnering with a select company(s) to provide the “missing components” that might make up a “complete solution” in your marketing strategy.
- You have a voice with i•SHOP! In the i•SHOP community, all members have a voice and are encouraged to get involved as we continue to enhance and map out the next releases of the specification.
- AAIA Involvement – with AAIA’s governance of the standard, you get the added benefit of being able to link with other industry standards, such as parts catalogs, vehicle identifiers, etc. As AAIA continues to develop new standards in the Automotive Industry, i•SHOP will be a direct benefactor of those efforts. To duplicate the databases available would far surpass your investment in AAIA and i•SHOP.

4. System Requirements

i•SHOP implementation is designed to be “development system friendly”. It can be implemented using programs written in the popular 32-bit languages (i.e. Microsoft Visual Basic and C++). It is also database independent. Fundamentally, it requires an operating system of Windows 95, 98, 98SE, ME, NT or Windows 2000. For optimum performance it should be implemented on Pentium class computers. It can be implemented on any network (i.e. Novell, Microsoft, etc.).

5. Technical Overview

5.1 Features Identified for i•SHOP Version 1

- Shop Management Information is available in the Back Shop.
- Service Information is available everywhere.
- Parts Information is available everywhere.
- Results from the Back Shop are stored in the Front Shop.
- Back Shop Results are viewable in the Front Shop.

5.2 Technology Employed

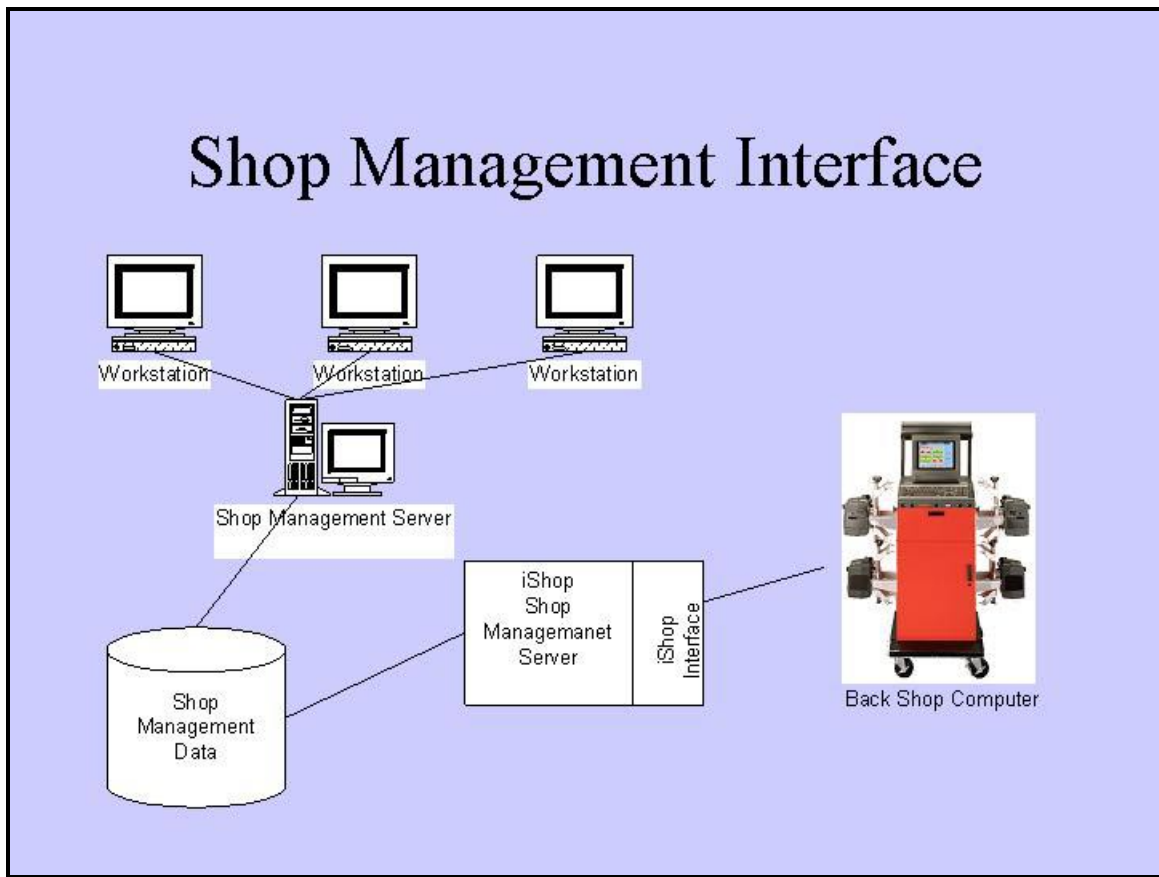
5.2.1 General

The i•SHOP standard uses an object-oriented approach heavily leveraging Microsoft’s Component Object Model (COM). COM objects are accessed over networks using DCOM (Distributed Component Object Model). Using COM and DCOM as our implementation foundation leverages proven technologies, which reduces development time and reduces the risks of incompatibilities within Microsoft Windows-based operating systems and development environments. In i•SHOP, all i•SHOP Features are organized into Objects. These objects can then be shared between components. For example, a “Vehicle Object” is created when a vehicle is entered into a Front-Shop order-entry/shop management system. This Vehicle Object is available to all back-shop equipment. If the vehicle is due for a front-end alignment, the i•SHOP compatible Front-End Alignment Computer will access the Vehicle Object, so the vehicle does not have to be keyed into the Alignment Computer.

5.2.2 i•SHOP Interfaces and Objects

This section will provide an overview to the various objects and interfaces employed in the i•SHOP network environment.

The i•SHOP Shop Management Server implements the i•SHOP Shop Management Interface to provide a standard interface to shop management information. In addition, the Shop Management System will provide data storage and retrieval methods for other equipment. It must also be capable of accepting information delivered from back-shop equipment on request of the back-shop equipment. Shop Management functionality is exposed using a series of COM interfaces, each with one or more related methods and properties:



5.2.2.1 IiShopManagement Interface

- Shop Management Objects provide access to shop management information:
 - Customer
 - Vehicle
 - Order List
 - Technician List
 - Item List

Applications that require access to the SMS and its services begin by invoking the IiShopManagement interface. Shop Management organizes shop activity around an Order.

Orders can be estimates or quotes, or contain authorization to perform work such as repair orders or work orders. Customer information, vehicle information, and specific order items may also be associated with the order. IiShopManagement Interface provides methods and properties to directly access an order and items on an order if the associated identifiers (ID's) or order number string are already known. If identifiers are not known, searching and browsing existing orders can be initiated by using the GetOrderList method. Once a desired order is located, related information such as customer and vehicle data is then available by providing their unique identifiers (ID's) to the methods. Identifiers (ID's) are unique to the Shop Management Server providing the interfaces.

5.2.2.2 IiShopOrderList

- Provides a list of work orders that match criteria specified in a search
- Methods:
 - Search
 - MoveFirst
 - GetSearchCriteria
 - CustomerID, Vehicle, OrderID, FullName, Location, etc...

The IiShopOrderList interface supplies browsing services that can be used to search, sort, navigate, and display summary information to locate and select an order. Suggested sequence after acquiring the interface is to set the search results criteria and sort criteria, invoke the search method, and display on the client application the property values for each order found.

The client can then acquire a specific IiShopOrder using the desired identifying OrderID string value.

5.2.2.3 IiShopOrder Interface

Individual order information is available through the IiShopOrder interface. Services supplied can be used to examine and update data.

Methods:

- Odometer
- Item List
- Customer
- Vehicle
- Alert

5.2.2.4 IiShopItem Interface

Individual line items are manipulated through the IiShopItem interface. Services supplied can be used to extract and update information in the line item and managed by the shop management system.

An order contains one or more items:

- Description
- Status
- Note
- Alert
- Storing, retrieving results

5.2.2.5 Diagnostic Result

- Stores the result of a procedure performed in the back shop.
- Is capable of displaying its results as an ActiveX Object.
- Methods:
 - GetProgramID
 - GetLength

Diagnostic Result - record of diagnostic procedure generated by a software application within the shop environment that consists of 2 items in terms of implementation: a data storage containing the diagnostic results produced by the application, and software to interpret (extract and view) the results. Without the software component the diagnostic results cannot be viewed or otherwise accessed.

A COM object or objects provide visual representation of the Diagnostic Result, as well as access to data contained within the result.

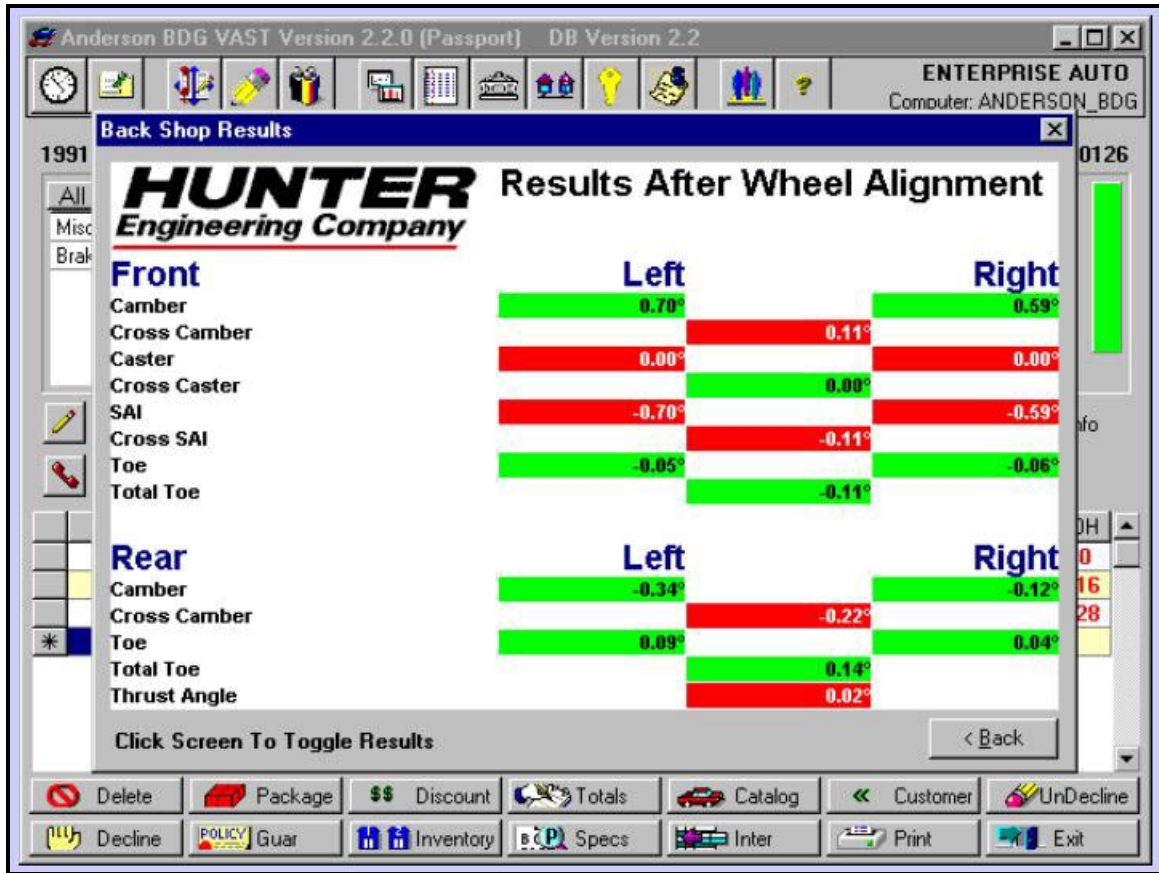
Data encapsulation function is handled by implementations of COM interfaces IPersistStream and IPersistPropertyBag, and by the i•SHOP custom interface IiShopDiagnosticInfo. Visual representation functions are handled by implementation of custom i•SHOP interface IiShopViewResult, along with standard ActiveX control interfaces.

The Diagnostic Result Object is created by a back shop application and then passed to a Shop Management component for storage in a database. The Diagnostic Result Object is stored in association with a line item in a work order. Multiple Diagnostic Results may be stored per line item. Diagnostic Results associated with a line item may originate from different back shop applications. The Shop Management component provides methods to search for and retrieve Diagnostic Results from the front shop database. Diagnostic Results could reside on a stand-alone system and be stored separately from the Shop Management system

Implementation of Diagnostic Result is the responsibility of the back-shop developer.

Front-shop developer is responsible for handling the database storage, retrieval, and search functions.

Refer to the following example of a back shop result being displayed from a front shop management system:



It is expected that most back-shop developers will choose a single COM object to both encapsulate Diagnostic Result data and implement visual representation of the data.

However, the developer may implement the visual representation in a View Object separate from the Data Object.

Regardless, the COM object which provides the visual rendering of the Diagnostic Result (i.e., implements the `IiShopViewResult`) must be a Microsoft ActiveX control.

5.2.2.6 Diagnostic Result Servers

- Implemented by Back Shop Equipment.
- Support ActiveX for display of data.
- Support Printing.
- Used by Front Shop Equipment.
- Future considerations include XML for access to internal data.

5.2.2.6 Customer Interface

- Represents a single customer.
 - Address
 - Name
 - Phone numbers
 - Email

5.2.2.7 Vehicle Object

- Identifies vehicles.
- Passes around with the WorkOrder.
- Used by Shop Management, Parts, Information and back shop to represent the vehicle.
- Becomes “smarter” as it is passed between equipment and more attributes are added to it (i.e. there may be a piece of information that was not keyed at the front shop that is required by a piece of diagnostic equipment. As this incremental information is added, the object retains as it is passed to other equipment.


5.2.2.8 iShopVehicle Interface

- Represents a vehicle using i•SHOP standards.
- Represents a vehicle as a combination of qualifiers or a single AAIA ID.
- Stores information such as VIN, License plate and note.

See the following example of sample AAIA Vehicle Identifier records:

Sample AAIA records

AAIA_ID	YEAR	MAKE	MODEL	SUBMODEL	ENG	LITER	CC	CID	FUEL	FUELDEL	A&P	ENGIN	ENG DESG	COUNTRY	DATE	NOTES
1367849	2001	ACURA	CL	S	V6	3.2	3206		GAS	FI	N		J32A2	U	7/19/2000	
1352337	1999	ACURA	CL		L4	2.3	2234		GAS	FI	N	YA3	F23A1	U	10/25/1999	
1001057	1992	ACURA	VIGOR	GS	L5	2.5	2451		GAS	FI	N	CC2	G25A1	UC	10/25/1999	
1001068	1992	ACURA	VIGOR	LS	L5	2.5	2451		GAS	FI	N	CC2	G25A1	UC	10/25/1999	
1001204	1995	ALFA ROMEO	164	LS	V6	3	2959		GAS	FI	N	3		UC	6/18/1997	
1368187	2001	AUDI	A8 QUATTRO		V8	4.2	4172		GAS	FI	N		AKB	U	7/19/2000	
1370797	2001	AUDI	A8 QUATTRO		V8	4.2	4172		GAS	FI	N		ALK	U	10/20/2000	
1303344	1998	CHEVROLET	C1500 PICKUP		V6	4.3	262		GAS	FI	N	W	L35	UC	10/25/1999	
1303355	1998	CHEVROLET	C1500 PICKUP		V8	5	305		GAS	FI	N	M	L3D	UC	10/25/1999	
1069646	1978	DODGE	ASPEN		L6	3.7	3687		GAS	CARB	N	D		UC	2/8/2000	
1299797	1984	FERRARI	308 GTB		V8	3	2927		GAS	FI	N			UC	7/21/1997	
1339466	1952	FORD	VICTORIA		V8	3.9	239		GAS	CARB	N			U	10/26/1998	
1363384	2000	JEEP	CHEROKEE		L6	4	242		GAS	FI	N	S		U	10/25/1999	



5.2.2.9 AAIA (APAA) Qualifiers

- Additional Qualifiers may be associated with a Vehicle Identifier.
- AAIA provides for qualifiers being added by front shop or back shop equipment.

See the sample qualifiers below:

Sample Qualifiers		
VQUALIFIER_ID	GROUP	QUALIFIER
1000	ABS	WITH ABS BRAKES
1005	ABS	WITHOUT ABS BRAKES
1010	ABS WHEELS	2 WHEEL ABS BRAKES
1015	ABS WHEELS	4 WHEEL ABS BRAKES
1020	AIR CONDITIONING	WITH DEALER AIR CONDITIONING
1021	AIR CONDITIONING	WITH REAR AIR CONDITIONING
1025	AIR CONDITIONING	WITH FACTORY AIR CONDITIONING
1030	AIR CONDITIONING	WITHOUT AIR CONDITIONING
1031	BODY DOORS	EXCEPT DUTCH DOORS

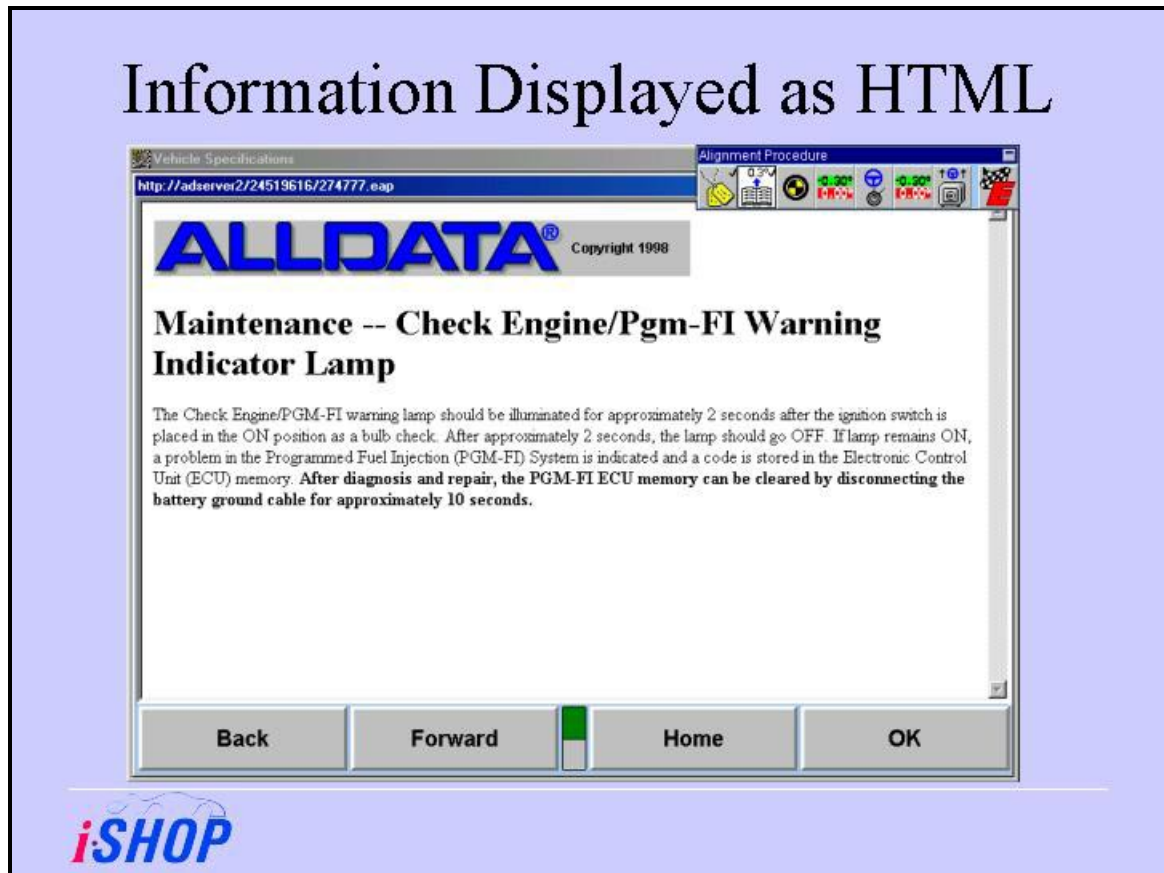
5.2.2.10 Photo/Attachments

- Represents photos that can be associated with an item.
- In the future may represent other sorts of attachments.

5.2.2.11 Parts, Labor and Repair Information

- Provides a common approach for accessing Parts, Labor and Repair Information.
- Objects and methods navigate parts and information databases.
- Data can be accessed as data records or can be displayed in HTML format in an ActiveX control.

See illustration below for example of this implementation:



5.2.2.12 Repair Information Interfaces

- IiShopRepairServer
- IiShopNavItem
- IiShopNavCollection
- IiShopTireFitmentData
- IiShopFluidCapacityData
- IiShopMaintenanceData

5.2.2.13 Repair Server Navigation

- A. Use the Navigate method of the IiShopRepairServer to navigate by:
 - PartNumber
 - OperationName
 - TroubleCode
 - ServiceCategory
 - Symptom
- B. Select a document type:
 - Wiring Diagram
 - Repair Service Procedure
 - Technical Service Bulletin
- C. Navigate Method returns a IiShopNavCollection
 - The NavCollection represents the choices that should be presented to the user.
- D. User Selection
- E. HTML Display
- F. Fielded Data Display
 - IiShopTireFitmentData
 - IiShopFluidCapacityData
 - IiShopBatteryData

5.2.2.14 Parts & Labor Server

- Navigation is similar to the Repair Server Interface
- Provides Interfaces for Part Data
 - IiShopPrice
 - IiShopMessage
 - IiShopMessageCollection
 - IiShopManufacturer

5.2.2.15 Installation & Registration

The i•SHOP environment can have server components from a variety of companies running on several computers. All information about servers are represented in a consistent way so that servers can be easily located by client applications and so that the integrated shop can be maintained using a common set of procedures.

The Windows Registry is used to represent all of the information necessary for client applications to locate and launch servers. Servers will be required to provide tools for creating the required registry entries. Client applications will be responsible for using the appropriate registry entries and for providing a user interface for maintaining the user preferences that are stored in the registry.

By using a common set of registry entries and installation procedures, clients from a variety of companies will be able to provide users with access to servers running locally or remotely.

The Registry entries will also allow client applications to access multiple servers without any reinstallation procedures.

The Windows registry will contain all of the information necessary to locate and launch servers.

On the client system this will include: location of the servers on the network, program-id of the servers, and users' preferences for the order in which servers should be utilized.

Client applications will read the registry to determine the identity and location of server applications. This information will be stored in the same location on all client systems regardless of the manufacturer of the equipment.

Server Description Keys:

The Servers entry in the AAIA key area will describe all of the servers that are available. Within the Servers key, there will be sub keys for each of the major server types.

Capabilities Key:

To help clients to choose the most appropriate server, the registry entries for parts and labor servers should list the data that they are capable of providing in the Capabilities key.

Vehicle Key:

The Vehicle key represents a stand alone vehicle server that can be instantiated and used independently of a shop management server to represent a vehicle. The stand-alone vehicle server might be used by back shop software in association with a parts and labor server.

Default Client Key:

There will be a single Default client key that specifies the default server preferences. Within the Default key there are keys for each of the major server types.

Overriding the Default Values:

To override the default values, client applications can create their own entries in the Client area.

Server DLL and EXE Naming:

To avoid conflicts with DLL names, all DLLs created to support AAIA servers should be given unique names. To make the names unique, the name of the company that created the DLL should prefix the name DLL, e.g., BigCo_Server01.DLL.

- Clients will be able to locate and launch servers using a standardized method.
- Servers will be responsible for registering themselves on client systems.

Server Registration Program:

Anyone creating a server will be responsible for providing a “ServerRegistration” program that installs all of the necessary Server information into the client’s system registry. The “ServerRegistration” program’s main responsibility will be the installation and maintenance of the registry entries contained in HKEY_LOCAL_MACHINE\SOFTWARE\AAIA.

Refer to following illustrations:

Server Registry Information

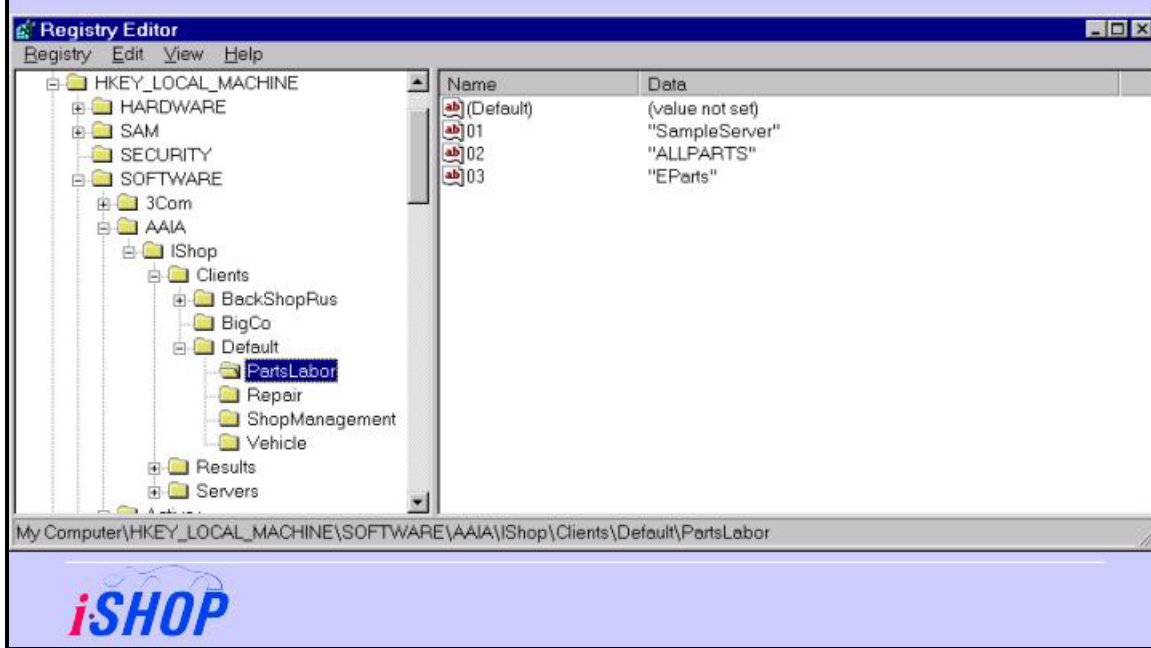
- Servers will register information about themselves on client systems.

Name	Data
(Default)	(value not set)
ApplicationTitle	"RParts PartsRUs DVD Based OEM Parts Database"
Capabilities	"AFTERMARKET_REPAR.OEM.LABOR"
HostName	"ALLCOMP"
ProgID	"AllParts.PartsSys.02"

My Computer\HKEY_LOCAL_MACHINE\SOFTWARE\AAIA\IShop\Servers\PartsLabor\ALLPARTS

Server Default List

- The registry will contain information about the servers selected for use by clients.



5.2.2.16 Using i•SHOP in the Back Shop

- Establish Connection to the Front Shop.
 - Identify the computer from registry entries.
 - Identify the server application.
- Request a list of work orders.
 - Use a search criteria.
- Select a work order.
- Qualify AAIA.
 - Convert AAIA identifier into a local identifier.
 - Add qualifiers if appropriate.
- Access Shop Information.
 - Show Parts or Service info in a Web Browser.
- Complete Procedure.
- Send Results to the Front Shop.

5.2.2.17 Definition of a Server

- A separate application that implements the Shop Management Objects.
- Compiled as an EXE.
- Supports DCOM for accessing methods.
- Created by filling in the blanks in a DCOM shell created by Visual C++ or Visual Basic.

5.2.2.18 Server Code

- The DCOM Wrapper Code is provided automatically.
- Methods become C++ or VB functions.
- Fill In the function with code that is unique to your system.
- DCOM makes it possible to create objects and call methods over the network.

5.3 Networking Models

5.3.1 Remoting with DCOM

i•SHOP standards presume that DCOM will be the usual method of “remoting” servers.

Shop Management, Parts & Labor, and information servers will likely each exist on only one computer in a shop. Multiple client systems will remotely instantiate the servers using DCOM.

By using DCOM, very little needs to be installed on the client systems. The client system need only have the registry entries that identify the location and program ID of servers. When the client instantiates the server, the client is actually running a program on a remote system. The client should know where and what to launch, but little or none of the server’s program or data should be installed on the client system.

5.3.2 Client and Server on Same Machine

The client and server may run on the same system. For example, a small shop might not have a network, but may still want access to an “Information” server from back shop management.

In this case the information server and all of its data would be installed on the back shop computer. The Server registration would also be executed on the back shop computer.

However, the computer name specified in the registry would be blank indicating that the server should be launched locally.

5.3.3 Client and Server on Same Machine with Data on Remote System

It is possible to run the server on the same system as the client with the data that is accessed by the server on a remote computer. For example, a parts server that retrieves information over the Internet could be installed on back shop equipment. The client (which is running on the same computer) would access the server using standard i•SHOP interfaces. The server would reach across the Internet using whatever protocol it desired to access the data.

The client would remain ignorant of the location of the data and the technology that the server used to access it. In such a configuration, the HostName entry in the server’s registry information would be blank, indicating that the server should be launched on the same computer.

In this configuration, DCOM is not being utilized. The disadvantage to this configuration is that the server must be kept up-to-date on all client systems. In this configuration, the Server Registration program and Server installation program could be combined.

6. I Want to Implement i•SHOP – Now what?

We sincerely hope the high level overview provided here has given you a sense of the work that has been done in this project. It is only through the efforts of the current membership that this vision has been realized. If you have decided i•SHOP is for you, here are the steps to take:

6.1 Membership Information

You can get a New Participant Application Form from the AAIA Website (or you received one with this package). The following page highlights of the features and benefits described on that document:

i•SHOP NEW PARTICIPANT APPLICATION FORM

Thank you for your interest in becoming a licensed **i•SHOP Participant**. As an **i•SHOP Participant** you will have the following benefits and opportunities available to you:

- Licensed to use i•SHOP Standards
 - Opportunity to Participate in Standards Setting by Participating in SITF
 - Obtain i•SHOP Standards in Hard Copy or Digital format as Published
 - Obtain i•SHOP Standards IDL (Interface Definition Language) as Published
 - Company Logo is Placed in i•SHOP Brochure (Company Logo Sheet)
 - Company Eligible to Receive Copies of i•SHOP Brochure for Distribution N/C:
 - Category 1 Participant Will Receive 200 Brochures
 - Category 2 Participant Will Receive 100 Brochures
 - Category 3 Participant Will Receive 50 Brochures
 - Additional Brochures Can Be Purchased at \$1.75 each
 - Company Eligible to Receive Copies of i•SHOP Video Tape
 - One Tape Per Participant N/C,
 - Extra Copies Available at Standard Copy Fees
 - Company Products Listed in Approved Listing of Equipment on i•SHOP Web Site with Certification
 - Company Logo and Listing on i•SHOP Web Site
 - Company Name listed as a Participant in all Press Releases
 - i•SHOP Sample Client Source Code
 - i•SHOP Sample Server Code
 - i•SHOP Test Program Client
 - Process Documentation For Certification Test Plan (Client and Server)
 - Certification Appointment Includes One Hour Pre Certification Phone Support with i•SHOP Project Mgr.
 - Program Consulting Services are available from i•SHOP Project Manager at the rate of \$125.00 per Hour plus Travel expenses for onsite Consultation
 - Dues Are For a One Year Period January Through December
 - Product Certification Will Take Place at Canadian Tire, Retail City, Toronto, Ontario
 - Product Certification Must be Scheduled with i•SHOP Project Manager
- Application must be accompanied by exercised i•SHOP Non-Disclosure Agreement and i•SHOP Intellectual Property Agreement

Direct all correspondence to:

i•SHOP Standards
Automotive Aftermarket Industry Association
4600 East-West Highway, Suite 300
Bethesda, MD 20814
Tel (301) 654-6664 Fax (301) 654-3299

6.2 Membership Dues

Membership dues are as follows:

✓	Category	Company Revenues	Annual Dues
	1	Revenues Over 25 Million	\$12,000.00
	2	Revenues 10 to 25 Million	\$6,000.00
	3	Revenues 0 to 10 Million	\$3,000.00

The annual renewals insure the on-going development and enhancement of the specification, and are calculated to insure companies of all sizes are able to participate.

6.3 Certification and Testing

Once you have integrated i•SHOP into your product, and prior to release of that product as “i•SHOP Approved”, it will be installed and tested on an i•SHOP network and certified. This testing resource is located in Toronto, Canada at Canadian Tire Corporation Retail City, which is a prototype shop environment.

Prior to scheduling this certification test, you are encouraged to perform self test of the i•SHOP functions to insure you’re prepared for the final test. Also, it is encouraged that you bring a development system for the testing, as if problems are encountered many times they can be addressed “on the spot”. AAIA’s intent is to package prototype test applications in the Software Developer’s Kit to assist you in test of your own product.

You will schedule the certification test with the AAIA Project Manager (see contact information in Section 7). Our intent is to schedule testing at regular intervals to be determined by the amount of products to be tested during any given period, but never less than once per month. Once you and the Project Manager have agreed on a time and date, you will be supplied the travel information, etc.

6.4 Certification Approved!

When you receive your product’s certification, your product will be listed on the AAIA website as approved and included in next releases of marketing materials. You can proudly market the fact that you are in compliance with the i•SHOP standards.

When approval is complete, we encourage you to continue to participate in the development meetings. We encourage and are already mapping out future enhancements to the specification, and the best way to make sure your future needs are met is to continue participation.

7. Contact Information

Please feel free to contact us with any questions you may have. We realize this is a big decision for a company to make, and it is our commitment to provide as much information as possible to help you make the best decision to support your future strategies. Following is contact information with general guidelines, but feel free to contact either of these as is most convenient for you:

AAIA General Information, i•SHOP Enrollment, etc.:

Scott Lockett

AAIA

Senior Director - Information Technology

Phone: 330-654-6664

Fax: 301-654-3299

Email: scott.lockett@aftermarket.org

AAIA i•SHOP Technical Information, Project Management, etc:

Ben Johnson

AAIA

Project Manager, i•SHOP Standards

Phone/Fax: 616-345-3065

Voicemail: 240-333-1031

Email: ben.johnson@aftermarket.org