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An Amduus™ Information Works, Inc. Publication

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Publisher's Statement:

In the last issue, we explored some ways of managing our objects. In this issue, I propose an object template that can be used to start an object. Then you can begin filling in the blanks with your own routines and error messages.

I have been playing around with the template, creating objects out of it and learning what is useful and what is not. This should save you a lot of time and help you down the road to making more OOP based applications.

I also want to announce that Service Express is good to for use by companies that might be interested in a help desk software package. Be sure to read <http://amduus.com/serviceexpress> for more information about this offering.

This software tool can be used easily by people in the IT department, building maintenance department (think approaching your land lord!), and service calls for pieces of equipment. I am looking for consultants who are willing to resell access to this.

I also plan on adding companies where users are associated to a customer company and contracts/warranties for equipment AND the ability for companies to handle their own configurations.

Lets get on with the fun!

Scott Auge

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A Template for Object Oriented Programming with the Progress 4GL

By Scott Auge

Something to start with:

(You will need Progress Version 9 or better to perform this type of programming.)

As you read this article, you may think to yourself, “Hey, this is fun, but I can't use this in an existing system.” Well... actually you can mix this form of OOP and the usual 4GL Programming style. So be sure to read on!



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Lets speed up the process a bit. I am sure that there are many programmers reading this who have a good idea of a template of code that can be used to create objects. This is just the code – we are no where near inheritance yet. I assume that there are people out there who have not yet used the 4GL like this and so this is a step forward.

The template can be downloaded from:

http://amduus.com/OpenSrc/SrcLib/OOP/obj_template.p.

An Explanation of the Methods:

There are two procedures that act as housekeeping for your object.

PROCEDURE Init

When an object is first created, you should call the Init procedure. This procedure is responsible for setting up any default attributes your object should work under. (See below for `objsmtpmail.p`, that the mail type has not been set. It is defaulted to be text instead of HTML in the Init procedure. If one needs to create any other objects for use by the procedure, then that would be done in Init also.)

Note if you use the `objmgr.i` tool, this is automatically executed on creation of the object.

PROCEDURE Destroy

When you are finished using the object, you should call the Destroy procedure. This procedure does all the clean up of deleting temporary files managed by the object, etc.

Note that the Destroy procedure is automatically called when using the `objmng.i` tools.

Next are three procedures that let you set, get, and clear attributes in your object. The types of and names of attributes should be documented somewhere. The best place is in the code at the top of the file for easy reference.

PROCEDURE SetAttr

Use this procedure to set an attribute, or value, managed by the instance of the object. Remember you can have multiple instances of the same object running, all having different attributes associated with them.

It receives a string name and a string value. If the value requires type manipulation, that is the burden of the implementing programmer.

PROCEDURE GetAttr

This is the complement procedure for SetAttr. It will allow you to read an attribute from an object instance. It receives a string naming the attribute, and returns a string with the value of that attribute.

One may be inclined to try and use a function for this, instead of a procedure. I ran into problems of FORWARD declaring the function when two or more objects were defined and used in a program. Having the IN OMGH ("FunctionsObject") was just as unwieldy (in my opinion) as simply using a RUN statement. Your mileage may vary.

PROCEDURE ClearAttr

You should really never need to call ClearAttr.

There are circumstances where it can be useful. For example, in the mail delivery coded below, it would be inefficient to create and destroy multiple instances of the

object per mail message. So having the ability to clear out everything makes the object a little safer (no mistaken BCC sent out because one forgot to reset it from the last time!) Note since ALL the attributes would be destroyed, I needed to create a method that would allow me to reset the defaults again.

These two things are tied together in a ResetDefaults procedure in `objsmtpmail.p`, but would be difficult to example this in a call into it from the example use of it.

The following code provides an example of using the soon to be released `objsmtpmail.p` to deliver some mail.

```
{objmgr.i NEW}

/* Create an instances of the objectified smtpmail.p object */

RUN OMAAdd("Mailer", "objsmtpmail.p").

/* Set up */

RUN ClearAttr IN OMGH("Mailer").
RUN SetDefaults IN OMGH("Mailer").
RUN SetAttr IN OMGH("Mailer") ("From", "saug@amduus.com").
RUN SetAttr IN OMGH("Mailer") ("To", "test@amduus.com").
RUN SetAttr IN OMGH("Mailer") ("Subject", "Test of objsmtpmail.p").
RUN SetAttr IN OMGH("Mailer") ("Body", "Hello there!").

/* Call the method that will attempt to send the mail */

RUN SendMail IN OMGH("Mailer").

/* See if any error's occurred */

RUN GetAttr IN OMGH("Mailer") (INPUT "ErrorCode", OUTPUT cErrorCode).

IF cErrorCode <> "000" THEN DO:

    RUN GetAttr IN OMGH("Mailer") (INPUT "ErrorMsg", OUTPUT cErrorMsg).
    MESSAGE cErrorMsg.

END. /* IF cErrorCode <> "000" */

/* Clean up */

RUN OMDel ("Mailer").
```

Error handling is done with attributes. I tend to use ErrorCode to use a “number” or symbol to represent the error. Makes it a bit easier on the IF statements to do so. I also have an ErrorMessage that reads in a manner more friendly to the human mind.

Now lets talk about your attributes and methods...

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Attributes are pretty easy to add. One merely sets them. Looking in the template code, you can see that attributes are merely stored in a temp table local to that procedure.

Setting up new methods really depends on what you want to achieve with the object. This is where experience comes in.

Believe it or not, this is the third re-write of obj_template.p code because as I use it, I find myself polishing it and simplifying it. For example, I had planned Set and Get methods for every single attribute. That is a lot of r-code that doesn't need to be there – added complexity too.

You may want to create a intSetAttr for integers, and

a dateSetAttr for dates if you expect to do a lot of work with those types. Personally I do not believe there is much expense casting them between types, and *I feel that program complexity is far more dangerous than buying a faster processor* (which we tend to do every three or four years anyhow.)

When creating your objects, I would focus on what you want your object to DO in a business logic sense rather than the means of doing it. Let the means of doing it be a set of *tool* oriented methods that might be called by an implementing programmer, but not essential to them using the application. In fact, any method in an object that calls into a second method in the object, I define that second method to be one of these tool methods.

Methods can do the same things, but via a different manner depending on the

usefulness to the implementing programmer. Lets take a sales order object. It might have methods like this:

- `Init` – A basic init.
- `InitByRowID` – Initialize a sales order by having the RowID of a sales order header record. This is probably useful for manipulating a sales order from behind the scenes.
- `InitByPurchaseOrderNumber` – Initialize a sales order by the customers purchase order number. This might be useful for manipulating a sales order before the sales order is fulfilled.
- `InitByInvoiceNumber` – Initialize a sales order by the invoice number given the customer. This might be useful for manipulating a sales order after it has been fulfilled.

Of course you will want to do somethings to a sales order such as:

- `AddLine`
- `DeleteLine`

which are fairly obvious.

You may want to include more business work flow oriented methods such as:

- `SendToFulfillment`
- `CancelOrder`

or whatever process and procedure the company has to work sales orders.

The point I am trying to home in on, is that a lot of times as database programmers, we home in on not only missing the forest for the tree, but the tree it's self for the bark and leaves. Objects are about abstraction – creating constructs to mimic what happens out there in the real world for the organization.

The source code mentioned in this article, as well as more OO source, can be found in <http://amduus.com/OpenSrc/SrcLib/OOP/>.

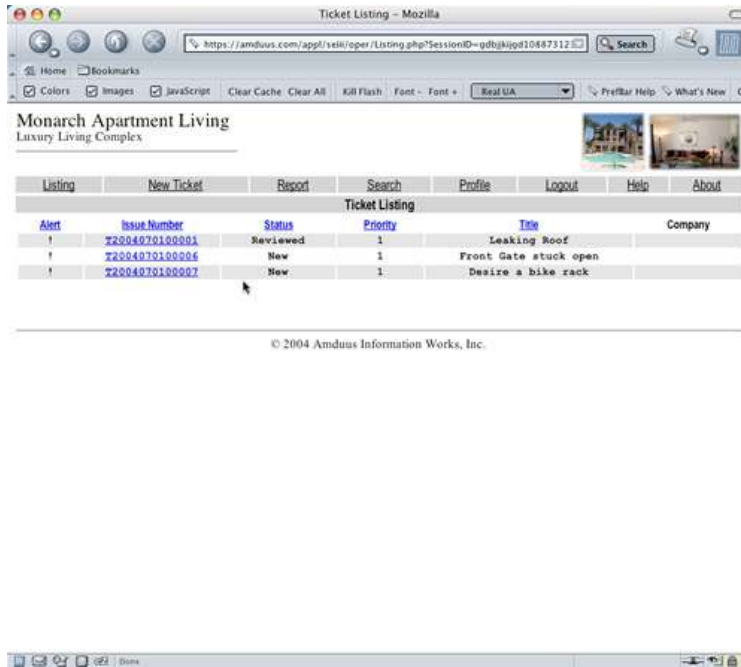
Scott Auge is the founder of Amduus information Works. He has been working with Progress technologies since Version 6. He works with UNIX platforms dealing with integration and web based applications.

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