When GRSManagerGUI is constructed it initializes the following in this order:

1. LoginPanel is constructed with GridBagLayout.
2. AdministratorPanel is constructed and initializes the following panels in this order:
   1. VendorEmployeeDirectoryPanel is constructed and initializes first instance of GRSManager by calling the static GRSManager method getInstance(). GRSManager contains a static instance variable of itself so the getInstance() method checks this instance variable for the current GRSManager and returns it if it exists. If it is null, no GRSManager has been constructed, it calls GRSManager’s constructor via the *new* keyword.
      1. GRSManager constructs the following data structure classes in this order:
         1. NioxCatalog
            1. LinkedListRecursive<Product> - an empty product list
         2. CompanyDirectory
            1. LinkedListRecursive<Company> - an empty Company list
         3. OrderRecord
            1. String [][] – an empty 2D string array
         4. Administrator
         5. UserDirectory
            1. LinkedAbstractList<User> - an empty list of User
      2. After GRSManager’s construction and subsequent creation of the above objects, **they are now available for access by all other GUI components. User actions call GRSManager methods, which may call data structure class methods.** VendorEmployeeDirectoryPanel initializes its own instances of UserDirectory and CompanyDirectory to GRSManager’s (which are empty lists of Users and Companies, respectively). VendorEmployeeDirectoryPanel sets up the rest of the GUI components for its panel and returns control to AdministratorPanel’s constructor.
   2. ResearchEmployeeDirectoryPanel
      1. Requests instance of GRSManager (previously constructed during VendorEmployeeDirectoryPanel’s request for UserDirectory and CompanyDirectory), and receives empty LinkedLists of users and companies.
      2. Sets up the rest of its GUI components and returns control to AdministratorPanel’s constructor.
   3. ProductCatalogPanel
      1. Requests same instance of GRSManager and gets the product catalog class (NioxCatalog) and sets its one instance of NioxCatalog to the empty product list that is returned.
      2. Constructs remaining GUI components and returns control to AdministratorPanel’s constructor.
   4. OrderRecordPanel
      1. Requests same instance of GRSManager and gets the empty list of users and companies by setting its own instance variables for UserDirectory and CompanyDirectory to those returned by GRSManager.
      2. Sets up GUI components and calls the updateTables() method. updateTables() calls the updateData() method in the private class OrderDirectoryTableModel.
      3. updateData() in OrderDirectoryTableModel requests GRSManager’s OrderRecord first and then a 2D array of data by calling getShortOrderInfo. At this point, GRSManager’s instance of OrderRecord has an empty 2D array of Strings so null is copied over into the 2D array returned by getShortOrderInfo.
      4. Control returns to AdministratorPanel which finishes setting up and adding GUI components. Control returns to GRSManagerGUI.
3. VendorPanel. The Login and Administrator Panels have been constructed. Along with them the panels VendorEmployeeDirectoryPanel, ResearchEmployeeDirectoryPanel, ProductCatalogPanel, and OrderRecordPanel are all added to a card layout in the AdministratorPanel. The GRSManager has been initialized with references to data structure classes.
   1. VendorPanel’s constructor initializes
      1. VendorCompanyOrderSchedulePanel which requests GRSManager’s currentUser instance variable. At this point it is null because no one has logged into the system. It also requests the NioxCatalog from GRSManager which has an empty LinkedList of products.
      2. Sets up GUI components and calls the updateTables() method which calls the udpateData() methods for
4. ResearchPanel