SWANSEA UNIVERSITY

MENG COMPUTING

CSM14 - INDIVIDUAL PROJECT

Specification Document

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Contents

1   Introduction

The purpose of this document is to provide a list of specifications for the system that are to be implemented as part of this project. To construct this list, the Requirements Document was analysed carefully to make sure that no requirements were left out. A Requirements and Specification Cross Reference list has been provided at the end of this document that each requirement has been catered for.

2   Specification

2.1   Diary

The specifications listed below are related to jobs.

ID	Specification Description
S-DI-1	The system will provide a web method that has the following parameters: user ID, date booked, absolute start date-time, absolute finish date-time, absolute total hours, expected start date-time, expected finish date-time, expected travel time, expected break time, expected total hours, order ID, customer ID, site ID, office comments, job allocation status, driver ID, subcontractor ID, plant ID, job status, actual start date-time, actual finish date-time, signature status, signature ID, signed start date-time, signed finish date-time, signed travel time, signed break time, signed total hours, driver comments, job rate, series ID, sent status, subcontractor agreed price, subcontractor order ID, multi plant ID, is master job (boolean), subcontractor allocated (boolean), subcontractor sent confirmation, plant type ID, invoiced total and invoiced rate. The method will then create a new entry in the job table of the database specifying a new job.
S-DI-2	Several web methods will be provided that take a job ID as a parameter. Each method will take an extra parameter specifying one of the details (e.g. job allocation status, driver ID, signed finish time) associated with that job. The method will then update the corresponding job held in the database.
S-DI-3	A web method will be provided with the following parameters: is daily (boolean), is weekly (boolean), is monthly (boolean), weekly multiple, monthly multiple, range type, range end date, range number of jobs, on Monday (boolean), on Tuesday (boolean), on Wednesday (boolean), on Thursday (boolean), on Friday (boolean), on Saturday (boolean), on Sunday (boolean), customer ID, site ID, order ID. Using these parameters, the web method will create a record in the database which states that a job will repeat. The parameters parsed in state how the job repeats.
S-DI-4	The system will provide a web method that takes a job ID as a parameter and deletes the corresponding record from the database.
S-DI-5	A web method will be provided that takes a job ID and returns the details for that job.
S-DI-6	A web method will be provided that takes a customer ID and returns all jobs relating to that customer.
S-DI-7	A web method will be provided that takes a date and returns all jobs booked on that date.

S-DI-8   A web method will be provided that takes an operator ID and returns all jobs assigned to that operator.

S-DI-9   A web method will be provided that takes a subcontractor ID and returns all jobs relating to that subcontractor.

S-DI-10   A web method will be provided that takes a site ID and returns all jobs relating to that site.

S-DI-11   A web method will be provided that takes a plant item ID and returns all jobs relating to that plant item.

S-DI-12   The system will provide a way of constructing a receipt as a PDF which can be printed locally or sent via email.

2.2 Maintenance

The specifications listed below cover equipment and services.

ID	Specification Description
S-MAES-1	The system must provide a web method that takes a name and a description as parameters. This method will then add a new plant type to the database using the given parameters.
S-MAES-2	A web method that returns the details of a plant type must be present. The method will require a parameter for the plant type ID.
S-MAES-3	The system must provide a web method that takes an ID, name and a description as parameters. This method will then update the details of an existing plant type in the database using the given parameters.
S-MAES-4	A web method that takes a plant type ID as a parameter is required. Using the given ID, the method will remove the corresponding plant type from the database.
S-MAES-5	The system must provide a web method that has a parameter for each of the following: registration, year made, make, model, date purchased, amount purchased, current value, colour, VIN, status, plant type ID and whether or not maintenance should be recorded. This method will then add a new plant item to the database.
S-MAES-6	A web method that takes an operator ID, plant ID and the current date-time as parameters is required. This will then update the database stating that the given operator has been assigned to the given plant at the given time.
S-MAES-7	To create a maintenance schedule for a plant item a web method will be required. The method must take four date-time value parameters and a comments parameter. These will specify the date of the next MOT, next service, next check, road tax expiry and any comments about the maintenance.
S-MAES-8	The system must provide a web method that takes a plant ID, the current date, an event name, plant mileage and comments as parameters. The method will then create a new event record in the database about the specified plant item.
S-MAES-9	Given a plant item ID as a parameter, a web method must return the history related to the specified plant item.

S-MAES-10	The system must provide a web method that has a parameter for each of the following: plant item ID, registration, year made, make, model, date purchased, amount purchased, current value, colour, VIN, status, plant type ID and whether or not maintenance should be recorded. This method will then update the details held in the database for the specified plant item.
S-MAES-11	Given a plant item ID as a parameter, a web method must return the details of the specified plant item.
S-MAES-12	A web method will be required that when called communicates with the middleware. It will tell the middleware that changes have been made to the plant items. The middleware will then deal with updating the plant item lists held on each PDA/smartphone.
S-MAES-13	Given a plant item ID as a parameter, a web method must remove the specified plant item from the database.
S-MAES-14	A web method will be required which has parameters for the following: service name, service description, standard hourly rate, evening hourly rate, weekend hourly rate, standard day rate, weekend day rate, hire type, minimum hire duration and whether or not multiple plant items are required. The method will allow new services to be created and added to the database.
S-MAES-15	The system must provide a web method that takes a service ID, plant item ID and a quantity as parameters. The method will update the database specifying what plant items are required to carry out a service.
S-MAES-16	A web method that takes a service ID as a parameter must be provided. The method will then remove the related service record from the database.
S-MAES-17	A web method will be required which has parameters for the following: service ID, service name, service description, standard hourly rate, evening hourly rate, weekend hourly rate, standard day rate, weekend day rate, hire type, minimum hire duration and whether or not multiple plant items are required. The method will update the details of the specified service with the given parameters.
S-MAES-18	The system must provide a web method that has a parameter for a service ID. The method will then return the details relating to the specified service.

Specifications related to the workforce are listed in the table below.

ID	Specification Description
S-MAW-1	The system must provide a web method with the following parameters: first name, surname, login name, password, phone number, mobile number, email address, address ID and rights level. The method will create a new user record in the database.
S-MAW-2	A web method must be present with a parameter for user ID and address ID. This will then update which address is associated with the specified user.
S-MAW-3	The system must provide a web method that takes a user ID as a parameter. Using the ID the method will query the relevant table in the database and return the users details.
S-MAW-4	The system must provide a web method with the following parameters: user ID, first name, surname, login name, password, phone number, mobile number, email address, address ID and rights level. The method will update the details of the specified user.
S-MAW-5	A method that takes a user ID as a parameter must be present in the system. Using the user ID the method will remove the specified user from the database.

ID	Specification Description
S-MAW-6	The system must provide a web method that has the following parameters: first name, surname, nickname, login name, password, current date-time, home phone number, mobile number, address ID, employment status, licence number, email address. Using the details parsed into the method, a new operator record will be added to the database.
S-MAW-7	A web method must be present with parameters for operator ID, start date, finish date and comments. Using these parameters the method will update the database with availability details for the given operator.
S-MAW-8	Given an operator ID as a parameter, a web method must return all information stored about the operators availability.
S-MAW-9	A web method that has parameters for operator ID and plant type ID must be present. The method will then add a record in the database stating what plant types the operator can use.
S-MAW-10	Given an operator ID as a parameter, a web method must return all information stored about that operator.
S-MAW-11	The system must provide a web method that has the following parameters: operator ID, first name, surname, nickname, login name, password, current date-time, home phone number, mobile number, address ID, employment status, licence number, email address. Using the details parsed into the method, the details of the specified operator will be updated in the database.
S-MAW-12	Given an operator ID as a parameter, a web method must remove the operator from the database.
S-MAW-13	A web method will be required that when called communicates with the middleware. It will tell the middleware that changes have been made to the operators. The middleware will then deal with updating the operator lists held on each PDA/smartphone.
S-MAW-14	The system must provide a web method that has the following parameters: name, address ID, phone number, contact name, email address, fax number, mobile number, status (active or inactive). The method will then create a new subcontractor record in the database using the parameters.
S-MAW-15	A web method that has parameters for subcontractor ID and plant type ID must be present. The method will then add a record in the database stating what plant types the subcontractor can provide.
S-MAW-16	Given a subcontractor ID as a parameter, a web method must return all information stored about that subcontractor.
S-MAW-17	The system must provide a web method that has the following parameters: subcontractor ID, name, address ID, phone number, contact name, email address, fax number, mobile number, status (active or inactive). The method will then update the details held for the given subcontractor using the parameters provided.
S-MAW-18	Given a subcontractor ID as a parameter, a web method must remove the subcontractor from the database.

A list of specifications relating to customers are displayed in the table below.

ID	Specification Description

S-MAC-1	A web method with the following parameters must be provided by the system: customer name, address ID, phone number, fax number, email address, contact name and a status. Using the parameters, the method will create a new customer record in the database.
S-MAC-2	The system must provided a web method that takes a customer ID, service ID, standard hourly rate, evening hourly rate, weekend hourly rate, standard day rate, weekend day rate, hire type and minimum hire duration as parameters. Using these, the method will add an entry in the database specifying custom service rates for the customer.
S-MAC-3	A web method with the following parameters must be provided by the system: customer ID, customer name, address ID, phone number, fax number, email address, contact name and a status. Using the parameters, the method will update the customers details in the database.
S-MAC-4	A web method that takes a customer ID as a parameter and returns the customer details will be needed.
S-MAC-5	A web method that takes a customer ID as a parameter must be provided. The method will then delete the corresponding customer from the database.
S-MAC-6	A web method with the following parameters must be provided by the system: address ID, phone number, fax number, email address, contact name, contact phone number, customer ID. Using these details the method will add a record to the database which specifies the details of a regional office for the given customer.
S-MAC-7	A web method that takes an address ID as a parameter is required. The method will then create an entry in the database specifying that the address is a site and will be assigned a unique ID.
S-MAC-8	The system must provide a web method that takes a customer ID, site ID, phone number, fax number, email address, contact name and contact phone number as parameters. Using these parameters, the method must create an entry in the database which links a site to a customer and specifies contact details for the site.
S-MAC-9	A web method that takes a site ID and a customer ID must be provided. Using the IDs, the method will remove the link between the customer and the site.
S-MAC-10	A web method that takes an address ID and a site ID as parameters is required. This will update the address that is associated with a site.
S-MAC-11	The system must provide a web method that takes a customer ID, site ID, phone number, fax number, email address, contact name and contact phone number as parameters. Using these parameters, the method must edit the details held in the database which links a site to a customer and specifies contact details for the site.
S-MAC-12	A web method that returns the details associated with a site is required. The method will have a site ID parameter to specify which site to retrieve the details for.
S-MAC-13	The system must have a web method that takes a site ID as a parameter. Using the site ID, the method will remove the associated site from the database.

The specifications relating to administration are listed in the table below.

ID	Specification Description

S-MAA-1	A web method must be available with the following parameters: customer ID, order date, has maximum limit (boolean), maximum value, contact name, description, order reference, is open ended (boolean), end date, user ID, service type ID, site ID, number of jobs limit. Using the parameters parsed into the method, a new order will be created and added to the database.
S-MAA-2	A web method must be available with the following parameters: order ID, customer ID, order date, has maximum limit (boolean), maximum value, contact name, description, order reference, is open ended (boolean), end date, user ID, service type ID, site ID, number of jobs limit. Using the parameters, the method will make the relevant changes to the order specified.
S-MAA-3	The system must provide a web method that returns the details of an order. It will require a parameter specifying the order ID.
S-MAA-4	The system must provide a web method that deletes an order from the database. It will need a parameter specifying the order ID.
S-MAA-5	A web method must be provided with parameters for: address line 1, address line 2, address line 3, address line 4, postcode, GPS location, keyword, GPS radius. Using these, the method will create an address record in the database.
S-MAA-6	A web method must be provided with parameters for: address ID, address line 1, address line 2, address line 3, address line 4, postcode, GPS location, keyword, GPS radius. Using these, the method will update the details of an address record in the database.
S-MAA-7	The system must have a web method that, when called, returns the details of all the addresses held in the system.
S-MAA-8	A web method must be provided that returns the associations of a given address, if any exist. The address ID will need to be parsed in as a parameter.
S-MAA-9	The system must have a web method that, when called, returns the details of all the addresses held in the system that are not linked.
S-MAA-10	A web method is required such that when given an address ID as a parameter, it removes the corresponding record from the database. A check must first be made to ensure the address is not linked.

The specifications listed in the table below covers aspects of the system related to 'In the Field'.

ID	Specification Description
S-MAF-1	The system must provide a web method with the following parameters: device number, phone number, purchase date, make, model, ID code and status. Using these, the method will then add a record for the device to the database.
S-MAF-2	The system must provide a web method with the following parameters: device number, phone number, purchase date, make, model, ID code and status. Using these, the method will then update the details for the device held in the database.
S-MAF-3	A web method that takes a device number as a parameter must be included. Using the device number, the method will remove the corresponding device record from the database.
S-MAF-4	A web method that takes a device number as a parameter must be included. The method will return all the details corresponding the specified device.

S-MAF-5	The system must include a web method that takes a device number, operator ID and the current date-time as parameters. Using these, the method will create a record in the database which states that the given device has been allocated to the specified operator.
S-MAF-6	A web method must be provided that takes an operator ID and a device number. The method will then remove the corresponding record in the database which states that the device is no longer allocated to the operator.
S-MAF-7	A web method that takes an operator ID as a parameter will be needed. This will then remove the link between the operator and a plant item.

The final section of the 'Maintenance' screen is titled 'Other'. This section allows the user a way of managing jobs that have been marked as requiring a digital signature but have not had one allocated. The specification for this section is below.

ID	Specification Description
S-MAO-1	The system must provide a web method that queries the job table and returns all of the jobs that are finished, require a signature and have not yet been sent for a signature to be collected.
S-MAO-2	A web method is needed that takes a job ID and an operator ID as parameters. The method will then update the details of the job in such a way that it specifies that the operator must collect a signature for the job.
S-MAO-3	A web method must be present that takes a Job ID as a parameter. Using the job ID, the method will update the details of the corresponding job setting the signature status to 1 and signature ID to SIG0.

2.3   Mapping

Below, is a list of specifications related to the mapping functionality of the application.

ID	Specification Description
S-MAP-1	To retrieve the most recent GPS coordinates of an operator, a web method will be required with a parameter specifying an operator ID. The method will query the database and retrieve the most recent GPS coordinates stored for that operator.
S-MAP-2	To retrieve the GPS coordinates of an operator, for a given time span, a web method will be required with a parameter specifying an operator ID, start date-time value and end date-time value. The method will query the database and retrieve the GPS coordinates stored for that operator that lay between the given time values.
S-MAP-3	To retrieve the most recent GPS coordinates of a plant item, a web method will be required with a parameter specifying a plant item ID. The method will query the database and retrieve the most recent GPS coordinates stored for that plant item.
S-MAP-4	To retrieve the GPS coordinates of a plant item, for a given time span, a web method will be required with a parameter specifying a plant item ID, start date-time value and end date-time value. The method will query the database and retrieve the GPS coordinates stored for that plant item that lay between the given time values.
S-MAP-5	The system will have a web method that returns the last stored GPS coordinates of each operator.

S-MAP-6	The system will have a web method that returns the last stored GPS coordinates of each plant item.
S-MAP-7	To retrieve each operators current location, a web method will be included that takes an integer value between 1 and 24 (number of hours) as a parameter. The method will return the most recent GPS coordinates for each operator if they were recorded within the specified amount of hours.
S-MAP-8	To retrieve the current location of each plant item, a web method will be included that takes an integer value between 1 and 24 (number of hours) as a parameter. The method will return the most recent GPS coordinates for each plant item if they were recorded within the specified amount of hours.
S-MAP-9	The system will need a web method that takes a job ID as a parameter. The method will then query the database and return all GPS coordinates associated with that job.
S-MAP-10	To retrieve the GPS coordinates of where an operator has logged in/out of their PDA/smartphone, a web method will be required that takes an operator ID, a from date-time value and a to date-time value. The method will query the database and return all GPS coordinates from the log table between the specified dates for that operator.
S-MAP-11	A web method will be provided that takes an address ID as a parameter. The method will query the database and return the GPS coordinates associated with the specified address.

2.4 Invoicing

A list of specifications for the invoicing section of the application are listed below.

ID	Specification Description
S-IN-1	The system will provide a web method that takes the following as parameters: invoice date, total net cost, discount, VAT, grand total, is paid (boolean), user ID, comments, discount percent, has been printed, has been posted and customer ID. Using these parameters, the method will create an invoice in the database.
S-IN-2	A web method that takes an invoice ID and a job ID will be provided. The method will create an entry in the database that specifies the job is part of the invoice.
S-IN-3	The system will provide a web method that returns all jobs that have not been associated with an invoice but are ready to be invoiced.
S-IN-4	A web method will be provided that queries the database with a job ID and returns a signature capture if one has been recorded.
S-IN-5	The system must provide a way of constructing an invoice in PDF format which can be sent via email or printed locally.
S-IN-6	A web method will be provided that takes an invoice ID as a parameter and returns all details related to the specified invoice.
S-IN-7	The system will provide a web method that takes a job ID as a parameter. The method will add a record in the database which associates the job with a dummy invoice ID. This states that the job has been invoiced manually.
S-IN-8	A web method will be provided with the following parameters: invoice ID, date paid, amount paid, user ID and a payment reference. This method will create a new record stating a payment has been made towards the specified invoice.

ID	
S-IN-9	A web method will be provided with the following parameters: payment ID, date paid, amount paid, user ID and a payment reference. This method will edit the corresponding payment record.
S-IN-10	The system will provide a web method that takes a payment ID as a parameter. The method will then delete the corresponding payment record from the database.

2.5   Settings

The specifications for the settings section of the application are displayed below.

ID	Specification Description
S-ST-1	A web method must be present with parameters for company name, phone number, fax number, email address, mobile number and website URL. This will update the company details held in the database.
S-ST-2	The system must provide a web method that takes a floating point value as a parameter. This value will then be used to update the value for VAT held in the database.
S-ST-3	A web method that takes a value for the minimum job duration as a parameter needs to be present. The method will then update the value held in the database for minimum job duration with this value.
S-ST-4	A web method that takes a value for the maximum job duration as a parameter needs to be present. The method will then update the value held in the database for maximum job duration with this value.
S-ST-5	The system must include a web method that takes a start date-time value and an end date-time value as parameters. The method will then update the boundaries for weekend work held in the database.
S-ST-6	A web method will be required which updates the boundary values for evening work. This method will have as parameters a start date-time value and end date-time value.
S-ST-7	A web method that returns the details of plant items that require maintenance to be carried out on them is required. The method will query the database for the number of weeks warning value. It will then query the database again to retrieve all plant items that require maintenance within the number of weeks.
S-ST-8	Any database calls will be made to a database that replicates the current database schema.
S-ST-9	The system will communicate with the middleware that is currently being used. This may be done using sockets.

2.6   Messaging

The specifications listed below relate the messaging section of the application.

ID	Specification Description

S-MES-1	The system must provide a web method to allow a message to be sent to operatives. It must have parameters for a message number, the ID of the driver sending the message, the IDs of the drivers the message has been sent to, the message and a date-time value for when the message was sent. The message must then be added to the database.
S-MES-2	A web method which takes a driver ID and returns a list of messages that have been sent from the specified driver ID must be present.
S-MES-3	A web method which takes a driver ID and returns a list of messages that have been sent to the specified driver ID must be present.
S-MES-4	The system must provide a web method that takes a message number as a parameter and deletes the specified message from the database.

2.7   User Interface

The specifications listed below are related the UI aspects of the application.

ID	Specification Description
S-UI-1	The application will be written using WCF services and ASP.NET MVC.
S-UI-2	A web method that takes a login name and a password will be provided. It will return true if the login name and password match a record held in the database. Otherwise, false.
S-UI-3	A logout button will be provided.
S-UI-4	A web method that takes a user ID will be provided. It will return the rights level of the specified user.
S-UI-5	Restrictions based on a users rights level will be placed on certain functionality.
S-UI-6	The MVC application will communicate with the WCF services provided.

2.8   Non-functional

Specifications related to non-functional aspects of the system are presented in the table below.

ID	Specification Description
S-NF-1	All written code will be commented appropriately.
S-NF-2	Good naming conventions will be used for classes, methods and variables.
S-NF-3	Methods will be created as generic as possible.
S-NF-4	The system will be tested thoroughly.
S-NF-5	The system will include adequate error handling and will provide the user with good information on how to rectify the problem where necessary.
S-NF-6	The UI screens will be easy to navigate and not over cluttered.
S-NF-7	The concurrency mode of WCF services will be set to multiple where required.
S-NF-8	Passwords will be stored encrypted.
S-NF-9	Checks will be made against a users rights level and only functionality they are allowed to access will be available to them.
S-NF-10	The colour scheme will be kept consistent throughout the application.
S-NF-11	The styling of the icons used will be similar.

3   Requirements and Specification Cross Reference

To ensure that each requirement has been catered for by the specification, a cross reference list has been provided.

Requirement ID	Specification ID
R-DI-1	S-DI-1
R-DI-2	S-DI-1
R-DI-3	S-DI-1, S-DI-2
R-DI-4	S-DI-1, S-DI-2
R-DI-5	S-MAO-3
R-DI-6	S-DI-1, S-DI-2
R-DI-7	S-DI-1
R-DI-8	S-DI-1, S-DI-2
R-DI-9	S-DI-1, S-DI-2
R-DI-10	S-DI-1, S-DI-2
R-DI-11	S-DI-1, S-DI-2
R-DI-12	S-DI-2
R-DI-13	S-DI-3
R-DI-14	S-DI-1, S-DI-2
R-DI-15	S-DI-1, S-DI-2
R-DI-16	S-DI-1, S-DI-2
R-DI-17	S-DI-2
R-DI-18	S-DI-2
R-DI-19	S-DI-4
R-DI-20	S-DI-2
R-DI-21	S-DI-5, S-DI-6, S-DI-7, S-DI-8, S-DI-9, S-DI-10, S-DI-11
R-DI-22	S-DI-12
R-MAES-1	S-MAES-1
R-MAES-2	S-MAES-1
R-MAES-3	S-MAES-2
R-MAES-4	S-MAES-3
R-MAES-5	S-MAES-4
R-MAES-6	S-MAES-5
R-MAES-7	S-MAES-5
R-MAES-8	S-MAES-5
R-MAES-9	S-MAES-5
R-MAES-10	S-MAES-5
R-MAES-11	S-MAES-6
R-MAES-12	S-MAES-7
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R-MAES-14	S-MAES-10
R-MAES-15	S-MAES-11

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R-MAW-9	S-MAW-6
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R-MAC-2	S-MAC-1
R-MAC-3	S-MAC-1
R-MAC-4	S-MAC-1
R-MAC-5	S-MAC-2
R-MAC-6	S-MAC-3
R-MAC-7	S-MAC-4
R-MAC-8	S-MAC-5

R-MAC-9	S-MAC-6
R-MAC-10	S-MAC-6
R-MAC-11	S-MAC-6
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R-MAC-14	S-MAC-8
R-MAC-15	S-MAC-8, S-MAC-9
R-MAC-16	S-MAC-10, S-MAC-11
R-MAC-17	S-MAC-12
R-MAC-18	S-MAC-13
R-MAA-1	S-MAA-1
R-MAA-2	S-MAA-1
R-MAA-3	S-MAA-1
R-MAA-4	S-MAA-1
R-MAA-5	S-MAA-1
R-MAA-6	S-MAA-1
R-MAA-7	S-MAA-1
R-MAA-8	S-MAA-2
R-MAA-9	S-MAA-3
R-MAA-10	S-MAA-4
R-MAA-11	S-MAA-5
R-MAA-12	S-MAA-6
R-MAA-13	S-MAA-7
R-MAA-14	S-MAA-8
R-MAA-15	S-MAA-9
R-MAA-16	S-MAA-10
R-MAA-17	S-MAA-5, S-MAA-6
R-MAF-1	S-MAF-1
R-MAF-2	S-MAF-1
R-MAF-3	S-MAF-1
R-MAF-4	S-MAF-1
R-MAF-5	S-MAF-2
R-MAF-6	S-MAF-3
R-MAF-7	S-MAF-4
R-MAF-8	S-MAF-5
R-MAF-9	S-MAF-5
R-MAF-10	S-MAF-6
R-MAF-11	S-MAES-6
R-MAF-12	S-MAES-6
R-MAF-13	S-MAF-7
R-MAO-1	S-MAO-1
R-MAO-2	S-MAO-2
R-MAO-3	S-MAO-3
R-MAP-1	S-MAP-1
R-MAP-2	S-MAP-2
R-MAP-3	S-MAP-3
R-MAP-4	S-MAP-4

R-MAP-5	S-MAP-5
R-MAP-6	S-MAP-6
R-MAP-7	S-MAP-7
R-MAP-8	S-MAP-8
R-MAP-9	S-MAP-9
R-MAP-10	S-MAP-10
R-MAP-11	S-MAP-11
R-IN-1	S-IN-1, S-IN-2
R-IN-2	S-IN-1, S-IN-2
R-IN-3	S-IN-3
R-IN-4	S-IN-1
R-IN-5	S-IN-1
R-IN-6	S-IN-1
R-IN-7	S-IN-1
R-IN-8	S-IN-4
R-IN-9	S-MAP-9
R-IN-10	S-IN-5
R-IN-11	S-IN-6
R-IN-12	S-IN-7
R-IN-13	S-IN-8
R-IN-14	S-IN-8
R-IN-15	S-IN-9
R-IN-16	S-IN-10
R-ST-1	S-ST-1
R-ST-2	S-ST-1
R-ST-3	S-ST-2
R-ST-4	S-ST-3, S-ST-4
R-ST-5	S-ST-5, S-ST-6
R-ST-6	S-ST-7
R-ST-7	S-ST-8, S-ST-9
R-MES-1	S-MES-1
R-MES-2	S-MES-1
R-MES-3	S-MES-1
R-MES-4	S-MES-2
R-MES-5	S-MES-3
R-MES-6	S-MES-4
R-UI-1	S-UI-1
R-UI-2	S-UI-2
R-UI-3	S-UI-3
R-UI-4	S-UI-4, S-UI-5
R-UI-5	S-UI-6
R-NF-1	S-NF-1
R-NF-2	S-NF-1, S-NF-2
R-NF-3	S-NF-3
R-NF-4	S-NF-4, S-NF-5
R-NF-5	S-NF-6
R-NF-6	S-NF-7

R-NF-7	S-NF-4, S-NF-5
R-NF-8	S-NF-8, S-NF-9
R-NF-9	S-NF-6
R-NF-10	S-NF-10, S-NF-11