RigBoard Phase 3 Requirement

# Objective 目标

Rigboard phase 3 will provide the features to assist the improvement of resource utilization.

Rigboard第三期将实现一些提高资源利用率的功能。

Allow managers to manage employee availabilities such as vacation, sickness, training, or others.

允许经理管理员工的可用时间，比如假期、病假、培训或其他。

Allow managers to manage truck unit availabilities such as parking, repairing, or others.

允许经理管理卡车的可用性，比如停车、维修或其他。

Allow dispatchers to manage the crew availabilities to comply with regulation.

允许调度员管理班组的可用性以遵守法规。

Allow integration from Inthinc to update crew reset time and log in/out time.

允许集成Inthinc更新班组的重置时间和登入登出时间。

Allow notification sent to dispatcher when manager has changed the availability of resources.

当经理更改资源可用性时，可以发送通知给调度员。

Allow all changes may be taken into effect in eService.

允许所有更改可以在eService中生效。

# Roles 角色

District Manager 区域经理

Dispatcher 调度员

Supervisor 班组负责人

Operator 操作员

# Integration Point整合点

## ADP

## Inthinc

# User Story 用户故事

1. As a Dispatcher, I want to add a worker to a crew.

作为调度员，我想向班组添加一名工人。

1. As a Dispatcher, I want to add an unit to a crew.

作为调度员，我想向班组添加一个卡车。

1. As a Dispatcher, I want to assign one or many available crews to a job on RigBoard.

作为调度员，我想为RigBoard上的一个Job分配一个或多个可用的班组。

1. As a Dispatcher, I want to differentiate the crew type based on Unit Type, display different group of crews separately on the board.

作为调度员，我想根据团组内的卡车类型区分团组的类型，这样在展示板上它们可以显示为不同的分区。

Crew Type: Pumper Crew, Bulker Crew, Spare Crew.

Business Rule:

Pumper Crew: There is a pumper unit in the crew, that may contain 1 pumper, 1 tractor, 0 to many pickups. One Supervisor, one to many operators.

Bulker Crew: There is a bulker unit in the crew, that may contain 1 bulker, 1 tractor, 0 to many pickups. One to many workers.

Spare Crew: There is one to many pickups. One to many workers.

Design Notes: Business rules may change in future for more detail level control. In this phase, we only implement Crew contains multiple units and multiple workers. Let Dispatcher to choose the right ones. Crew type needs to be defined separately.

将来可能会更改业务规则以进行更详细的控制。 在这个阶段，我们只实现Crew包含多个Unit和多个worker。 让Dispatcher选择合适的。 Crew Type需要单独定义。

1. As a Dispatcher, I would like a crew members (workers and unit) are stay together for future assignment.

作为调度员，我希望班组成员（工人和卡车）留在一起以备将来任务分配。

1. As a Dispatcher, I want to move out an worker from a crew, to leave a slot to move in a worker.

作为一名调度员，我想从班组那里移除一名工人，留下一个空位移入一个可用的工人。

1. As a system, I would like to mark the crew is not available if any worker or unit is not available during the specified time range.

作为一个系统，如果在指定的时间范围内没有任何工人或卡车可用的话，这个班组被标记为不可用。

1. As a Dispatcher, I want to move a worker to a crew to make a crew available.

作为一名调度员，我想将一名工人移到一个班组，以让这个班组可用。

1. As a worker, I would like to book my vacation in ADP app, so my vacation will show I am not available for work.

作为一名工人，我想在ADP应用程序中预订我的假期，所以我的假期将显示我无法工作。

1. As a Manager, I would like to mark a work’s absence (Sickness, Personal Leave, Family Emergency, Vacation, etc.), so the absence will show the worker is not available for work.

作为经理，我想标记工人缺席（疾病，个人假，家庭紧急情况，假期等），因此缺席将显示工人无法工作。

1. As a Manager, I would like to mark a unit absence (Maintenance, Breakdown, Repair, Parked, etc), so the absence will show the unit is not available for work.

作为经理，我想标记一个卡车缺席（维护，故障，维修，停放等），因此缺席将显示该卡车无法工作。

1. As a Manager, I can only manage the worker and unit in my district.

作为经理，我只能管理我所在地区的工人和卡车。

1. As a Dispatcher, I can assign a crew to work in another district.

作为调度员，我可以指派一个班组到另一个地区工作。

1. As a system, I would like give dispatcher an alert if any availability conflict happens when manager books absence for a worker or unit.

作为系统，如果经理在工人或卡车缺席时发生任何可用性冲突，系统应该给调度员一个警报。

1. As system I would like to give manager an alert if any availability conflict happens when manager is booking absence for a worker or unit.

在经理正在登记一个缺席的工人或卡车时发生可用性冲突，系统应该向经理发出警报。

1. As system I would like to book a worker absence of 12 hours rest, once the worker has worked over 12 hours. (There is a business rule clarified later)

一旦工人工作超过12小时，系统应该登记一个12小时的休息（规则晚些会提供。）

1. As a Dispatcher, I want to withdraw a crew from a job.

作为一个调度员，我可以撤回一个Job的班组。

1. As a Dispatcher I would like to block crew’s time when it is assigned to job.

作为调度员，我希望当班组已经分配给一个job后，就锁定班组的时间。

1. As a Dispatcher, I want to mark a crew as Log On Duty when I received the text message from supervisor that his crew has arrived shop for job.

作为调度员，我希望标注一个班组为”Log On Duty”状态，当我接到班组长的短信告知班组已到厂区准备开始工作了。

1. As a Dispatcher, I want to mark a crew as Log Off Duty when I received the text message from supervisor that the crew has left shop for rest.

作为调度员，我希望标注一个班组为”Log Off Duty”状态，当我接到班组长的短信告知班组已离开厂区准备开始休息了。

# Process 过程

## Schedule Crew for a Job 为Job分配班组

When dispatcher is scheduling a job on rig board, he will look at another board called “Crew Board”. On Crew Board, it lists all crews and their status. Dispatcher may make a crew ready by adding/removing work/unit based on their availabilities. Then he can assign a crew to job. Once the crewed is assigned to a job, it won’t be assigned to another job. The crew can still be unassigned and re-assigned to another job.

当调度员在Rig Board上分配job时，他将能看一下另外一个叫Crew Board的界面。在Crew Board上，列出来所有班组和它们的状态。调度员可能根据它们的可用性增加/移除工人或卡车使得一个班组就绪。然后他可以分配班组给一个Job。一旦一个班组被分配给Job，它将不会被分配给其他Job。班组仍可以被取消分配和重新分配给其他Job。

Once the crew is called, its status will be changed, the crew is on-duty with the job. At this time, the crew cannot be unassigned from the job.

一旦班组得到电话通知，它的状态将会被改变，班组被改为正在这个job上工作中。此时，班组将不能被取消分配。

Once the crew calls in for Job Complete, the crew will be released from the job and be available again.

一旦班组被标记为已完成，它将从Job中释放出来并再次可用。

## Book Worker/Unit Absence工人/卡车请假

When a worker will take a vacation, he needs to book the vacation through ADP, which is human resource system. System integration will pull out the data from ADP every two hours to update the working availability.

当一个工人休假时，他需要通过力资源管理系统ADP请假。系统将每两个小时将ADP中的数据同步一次，更新工作时间可用性。

When a worker will take a leave for other reason, manager will book day offs on calendar to update the worker availability. If the worker didn’t book his vacation, manager can also mark worker’s day offs on calendar.

当工人因其他原因请假时，经理将在日历上预订休假以更新工作人员的可用性。 如果工人没有登记他的假期，经理也可以在日历上标记工人的休息日。

When a unit will be sent to repair, inspection, manager will book the day offs on calendar to update the unit availability.

当一个卡车被送去维修，检查时，经理会在日历上标记休息日以更新卡车的可用性。

# UI Consideration UI考虑

In phase 3, we are going to add some new features to Rig Board for the use cases related to rig jobs.

We need to add two new tab pages.

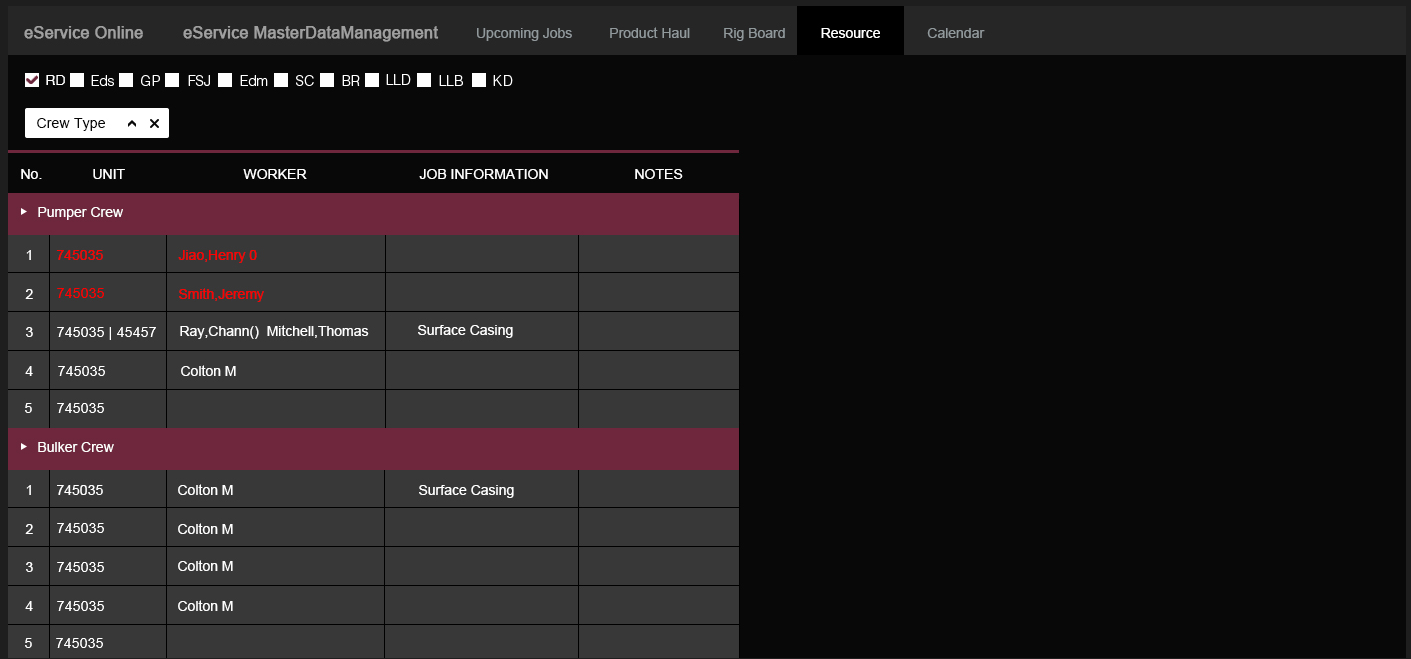
在第三阶段，我们将给Rig Board增加一些与RigJob相关的新功能。我们需要增加两个新的tab页。

## Resources

Resources – It is a dash board display the availabilities of different resources which may include Crew Board, Tools Board, Bins Board, etc. On one page, there will be different sections. In phase 3, we only implement Crew Board. But the mechanism is same for other different resources. So the design is critical for the resource schedule management. User can also be able to operate the object on these boards to manage the availabilities.

资源——它是一个展示板，显示不同资源的可用性，可能包括Crew Board，Tools Board，Bins Boards等等。在一个页面，将有不同的部分。在第三阶段，我们只实现Crew Board。但是这个机制与其他资源相同。所以设计对资源计划管理非常重要。用户也可以在这些Boards上操作这些对象来管理他们的可用性。

Resource页面样式如下：



### Context Menu

选中某一条Crew右键单击出现Context Menu，包括的菜单项有：Add unit、Add worker、Remove worker。

### Tooltips

鼠标悬停后显示当前Crew包括的Unit信息和Worker信息

## Calendar

Calendar – It is a calendar-based resources availability view and operation interface, user can manage the availabilities. Due to the display limitation, it is not possible to display all resources on one screen, the filters are needed.

日历——它是基于资源可用性的操作界面。用户可以管理可用性。由于显示的限制，不能在一个界面上显示所有的资源，所以需要过滤器。

默认当前页面显示当天的日历

# Architecture Consideration 架构考虑

## MDD driven MDD驱动

Phase 3 will be MDD driven, all business entities and facility entities should define up-front. The barebone system will be generated by MDD system. Developer will build the UI layer.

第3阶段将由MDD驱动，所有业务实体和设施实体应预先定义。 准系统将由MDD系统生成。 开发人员将构建UI层。

## Logging Infrastructure 日志

In the past, eService implements very limit logging features for some system exceptions. And also dome notifications for application failures. It gave developer and administrator a hard time to capture system failure information for problem solving and application improvement.

过去，eService为某些系统异常实现了非常有限的日志记录功能。 还有应用程序失败的通知。 它使开发人员和管理员很难捕获系统故障信息，以解决问题和改进应用程序。

Now with the Big Data technologies, if we have enough application operation data, we can get accurate business behavior and operation behavior from data, this will help us to optimize business process and user operation efficiency.

现在有了大数据技术，如果我们有足够的应用程序运行数据，我们就可以从数据中获得准确的业务行为和操作行为，这将有助于我们优化业务流程和用户运营效率。

And also, the logging may assist us for any data audit and performance review.

此外，日志记录可以帮助我们进行任何数据审计和性能审查。

Following events need to be logged.

需要记录以下事件

### Application Entry

The starting point which user uses the application. Basically, it describes the functional features of an application.

这是用户使用应用程序的起始点。基本上他描述了一个应用程序的功能特性。

Logging Data Elements: 日志数据元素

* User identity 用户ID
* Timestamp 时间戳
* Application Entry Identifier应用程序项标识符

Logging Point 记录点

* Functional Menu Clicking 功能菜单点击
* Functional Button Clicking 功能按钮点击

### Data Alternation 数据变换

The data change during the user’s application operations. This describes the data entry operation in two angels: 用户操作应用程序期间的数据更改。这描述了

* Operation efficiency 操作效率
* Business data flow 业务数据流

Logging Data Elements: 日志数据元素

* User identity用户ID
* Timestamp时间戳
* Data Identifier (Reflects UI module)数据标识符（反应UI模块）
* Previous value 之前的值
* Current Value现在的值

Logging Point记录点

* Update button clicking 点击Update按钮
* Before sending data update request 在发送数据之前更新请求

### Data Update 数据更新

The data update in database after the data alternation being processed by application logic. This will help us to verify the application logic to find out defects earlier.

应用程序逻辑处理数据更改后数据库中的数据更新。 这将有助于我们验证应用程序逻辑，以便更早发现缺陷。

Logging Data Elements: 日志数据元素

* User identity (or system identifier) 用户ID（或系统ID）
* Timestamp时间戳
* Entity Identifier 实体ID
* Previous value之前的值
* Current Value现在的值
* Request initiator (Reflects service entry) 请求发起者（反映服务条目）

Logging Point记录点

* Before Database update operation.数据库更新操作之前

### Application Error 应用程序错误

This data may assist us to find the application defect, logic deficiency and data deficiency as early as possible.

这些数据可以帮助我们尽早找到应用程序缺陷，逻辑缺陷和数据缺陷。

Logging Data Elements: 日志数据元素

* User identity用户ID
* Timestamp时间戳
* Machine identity机器ID
* Application Identity应用程序ID
* Application version应用程序版本
* Application Context应用程序上下文
* Application Call Stack应用程序调用堆栈
* Entity type identifier实体类型标识符
* Entity object identifier实体对象标识符

Logging Point 记录点

* System Exception Captured. 捕获系统异常。

### Business Entity Status Change (Optional) 业务实体状态更改（可选）

Although we can get business entity status change from Data Entry Log/Data Update afterwards, sometimes we need to be alerted by business entity status or trigger relevant business process according to business entity status change.

虽然我们之后可以从数据条目日志/数据更新中获得业务实体状态更改，但有时我们需要根据业务实体状态更改来提醒业务实体状态或触发相关业务流程。

Logging Data Elements: 日志数据元素

* User identity用户ID
* Timestamp时间戳
* Business entity identifier业务实体标识符
* Previous status之前的状态
* Current status现在的状态

Logging Point记录点

* Whenever the entity status change event is raised. 每当引发实体状态更改事件时。

一月十七日 更新说明

1. 在之前的描述中，对向班组中添加卡车和人员时，可用性强调过头了。实际上班组只是个容器，只有给了它时间线以后，才可以根据Schedule信息来判定其可用还是不可用。所以一个空闲的Crew 可以被随意添加或删减卡车和工人，它可用或不可用，应该在为其创建schedule的时候来判断，也就是需要先确定一个时间窗。
2. 在班组中需要标识出谁是班组长，将来也可能要求标识出不同的工位，这个设计是一致的。在班组实体中加上一个标识CrewPosition， 目前有两个选项Supervisor，Crew Member.
3. User Story 13中，Crew可以被调度到其他地区去工作，但它的行政归属还是原来的地区。所以在Crew中应该有两个属性，HomeDistrict和WorkingDistrict。在显示时，根据选择的地区不同，它在Working District是只读的，不能添加或修改团队成员。只有HomeDistrict可以。

从这个问题考虑到你们没有识别Crew的District这个属性。

在界面上，如果没有选择District，只显示它是空列表。

一月二十一日 更新说明

1. 新增Alert(Notification) 提示发送的需求

场景：当一个团队被分配了一个工作Job，一个提示将被以邮件方式或短信方式发送给团队负责人。

类似场景可以基于任何条件发送给任何人。

这是一个非常通用的功能。你们在其他项目上是否有已经有类似的实现？

如果有，可以借鉴。如果没有，需要按通用组件去设计。以服务方式进行耦合。

注意借鉴云服务平台的设计，如Azure，AWS

在我们这个项目中，只需要非常简单的实现。但高层接口需要在方向上定义基本正确。

参考阅读：<https://docs.microsoft.com/en-us/azure/notification-hubs/notification-hubs-enterprise-push-notification-architecture>

一月二十二日 更新说明

1. Resource Board、Calendar、Rig Board页面的Service Point过滤器，如果没有选择就不显示，避免一次加载所有数据造成性能问题。

场景：当一个团队被分配了一个工作Job，一个提示将被以邮件方式或短信方式发送给团队负责人。