# Maritime Platform Facilities POB Plan Management Module Research and Development

**Xiaojiao Tong**

CNOOC Ltd-Tianjin, Tianjin, China
Email: tongxj@cnooc.com.cn

## Abstract

There are many access ends and information asymmetry in the management of offshore platform production facility personnel information. In the actual business, the problem is decomposed and a multi-layer logical architecture is selected to design and develop the POB plan management module applicable to offshore platform facilities. The main functions of this module include task management, facility management, area management, sea-going unit management, plan management, report management, authority control, and comprehensive query. It can efficiently solve on-site business problems and improve the efficiency of POB plan management for various professionals on land and at sea. In actual use, the module can well assist in completing POB plan management tasks and improve work efficiency.

## Keywords

Maritime Platform Facilities, POB Management, Module Research and Development, Layered Architecture

## 1. Introduction

There are many production and operation facilities on offshore platforms, and the operation management is complicated. When dangerous situations occur, such as typhoons, distress, facility pipeline breakage, etc., it can lead to huge property losses and seriously threaten the safety of offshore operators. Therefore, accurate information on offshore platform production facilities personnel and other information can improve the efficiency of offshore platform operations, while effectively responding to risks [1] [2].

As the largest crude oil production base in China, Bohai Oilfield attaches great

importance to informationization construction. In the process of realizing management informatization, the POB plan management module for offshore platform facilities was developed [3]. The new module can realize production planning within the information management system, improve work efficiency and realize informationization of platform facility personnel management [4].

## 2. Issues Facing POB Program Management for Offshore Platform Facilities

The current POB plan management for offshore platform facilities is mainly done by both land and offshore personnel. The overall task arrangement for the year is determined at the beginning of the year, and the task plan is confirmed month by month. Each month, the plan for the following month is first formulated and adjusted by the land-based supervisor, and at the end of the month, it is confirmed by the offshore personnel and adjusted according to the actual work. In the specific implementation of the work will encounter data asynchrony, information dissemination asymmetry and other difficulties.

The work starts from the middle and end of each month and ends on the 30th, and is executed by the special engineer in charge. The process includes, the engineer in charge prepares the project resources, the professional supervisor adjusts the project priority, and the platform director reviews the POB plan.

The account controller is responsible for real-time adjustment and update of the POB plan on a weekly basis. The current process can be labor-intensive and difficult to trace the process. The main problems encountered in the business execution process are as follows.

1) Sharing by email and files is cumbersome, especially for multiple editors, which will generate a series of problems such as synchronization, among which version conflicts and data consistency problems are more prominent.

2) In the process of traditional file uploading, it is difficult to control permissions. The actual work often results in misoperation and other situations. Problems such as data loss and being overwritten by others are particularly common.

3) In the process of work, the capacity of oilfield facilities, overall tracking, facility inspection is more difficult, data statistics and report production and other workload is more heavy.

The above problems are fully considered in the design of POB plan management module for offshore platform facilities.

## 3. Design and Implementation of Multi-Level Plan Management Module

### 3.1. Module Design Ideas and Principles

The design of the POB plan management module for offshore platform facilities closely fits the management needs of the company's seafaring plan arrangement; it is implemented in steps according to the urgency of the actual needs: raising awareness, strengthening operation and maintenance, and enhancing training.

Design principles include unity, security, manageability, and scalability. Uniformity means having unity in planning, standard, platform, development, and management. Security means that the design fully considers the security management requirements. Manageability means that the software construction is convenient for the execution tracking management of daily operations and can realize flexible arrangement of operation plans. Scalability means to meet the increasing demand of offshore operation resource deployment [2] [5].

### 3.2. Module Function Structure and Implementation

The management module, based on requirement analysis, is based on the core of offshore project tracking and task plan management, and realizes the online integration of business through WEB software development technology.

As shown in **Figure 1**, the modular system is a three-tier logical architecture.

1) The access layer is the data exchange layer between the system and the outside and consists of the access logic. The access logic is divided into interface logic and interface services. For system users, diverse interface logic is provided to realize the sharing of business logic. For the external systems connected with the system, a set of interface services are provided to the business layer, which completes data exchange with external systems through the interface services. The access layer mainly includes the human-machine interface for system
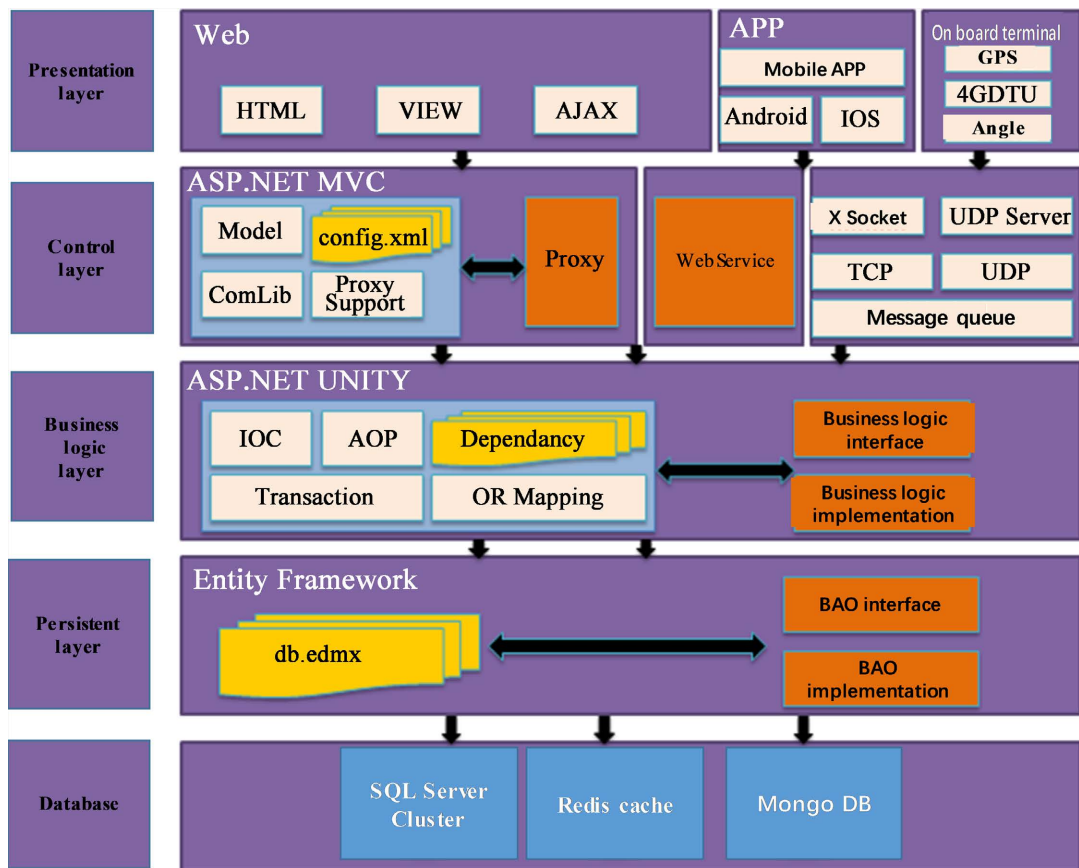


**Figure 1.** Architecture of POB plan management module of offshore platform facilities.

configuration, management, query and report, as well as the implementation of the external interface logic of the system. The access layer consists of interface logic and interface services.

The interface logic consists of the interactive interface, interface control logic and business process calls. The interaction interface is responsible for the data input from system users and the representation of system output data. The interface control logic is responsible for the logical control between the interactive interfaces. Business process calls are responsible for calling business function components in the business layer to complete the corresponding business functions. Multiple interface logics can be recombined to form new interface logics.

Interface service is a set of functional units for the system to complete data exchange with external systems. The business function components in the business layer realize data exchange with external systems through the interface services in the access layer.

2) Business processing layer is the logical layer for system business processing. It contains the core business logic, realizes the sharing of business logic, provides business services for the access layer, completes the corresponding business functions, realizes the core business processes, is controlled by the access logic of the upper layer, and realizes data access by invoking the data services of the lower layer.

Business components are divided into business functional components and business basic components, and business functional components provide complete functional services to external access. The realization of its functions is done by invoking the business base components of the lower layer. The business base component serves the upper layer components by abstracting and encapsulating the basic business rules. Process management defines the combination of functional modules according to specific business processes and schedules each functional module to complete business process processing.

3) The data service layer mainly organizes and centrally manages business data, provides standardized and efficient data services for the business layer, encapsulates data forms such as physical databases and files, and provides standard data access interfaces to the outside world to facilitate horizontal data sharing. The data layer is divided into two layers, data sub-layer and service sub-layer.

The data sub-layer records or stores business raw data, business statistics and system operation auxiliary data when the system is running. It contains the data information required by the business layer, and is the basis of the system operation and the concrete embodiment of the operation results. It is a collection of all kinds of data in the system, which must be stored, organized and managed centrally and uniformly in logic and geography.

The service sub-layer is the operational access layer to the data sub-layer, providing the business layer with direct access and control of business data in the form of a unified and standardized interface, and is the link for the business layer to access the data sub-layer.

## 4. Module Achievements and Income Analysis

The whole system mainly consists of 8 sub-modules, such as task management, facility management, area management, sea-going unit management, plan management, report management, authority control, and comprehensive query.

The system unifies the management of multiple business nodes such as plan collection, arrangement, tracking and statistical query. Users can access and expand flexibly through a browser. It improves the utilization rate of POB resources of offshore facilities and gives full play to the coordination capability of the information system.

The module can effectively solve the practical problems of field operations, reduce the POB plan management workload of the land and offshore professional supervisors and related leaders, land and offshore supervisors and leaders into the company's entire oilfield POB plan development and tracking, to achieve the full cycle of management functions from platform work task plan development, implementation to post-statistics. Solve the following practical business needs.

1) POB plan task formulation reporting and scheduling at the beginning of each facility.

2) The confirmation and adjustment of actual tasks of offshore personnel.

3) Statistics and export of monthly reports of facility POB plans.

4) The display and operation of Gantt chart for the development of the plan.

5) To realize the data configuration and management of plan, facility, personnel, profession and work task.

## 5. Conclusions

1) In view of the difficulties of POB plan management of offshore platform facilities, carry out business requirements analysis, integrate and clarify the main issues that need to be solved by the POB plan management module of offshore platform facilities.

2) Based on the demand analysis, integrate the business online through WEB software development technology, and complete the development of POB plan management module for offshore platform facilities to achieve continuous tracking of offshore projects and efficient management of task plans.

3) Using the offshore platform facilities POB plan management module, we can efficiently solve the actual problems of on-site business, reduce the POB plan management workload of various professionals on land and at sea, and significantly improve work efficiency.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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