ACCESS Health Digital
Powering the Future of Healthcare
A division of ACCESS Health International

Microservice Specification

Queue Management

Statement of Confidentiality

1. Functional Area –Queue Management

1.1. Purpose

This document describes the Business Requirements Specifications (BRS) for Queue Management in a primary care and specialist care setting.

1.2. Intended Audience

This document is intended for the Product Engineering team to commence development of 'Queue Management' microservice and the audience would comprise of

1.2.1. Development, Design & Implementation Team which may include Architects, Designers, Developers, and Business Analysts
1.2.2. Key stakeholders in the government at central and state levels

1.3. Overview

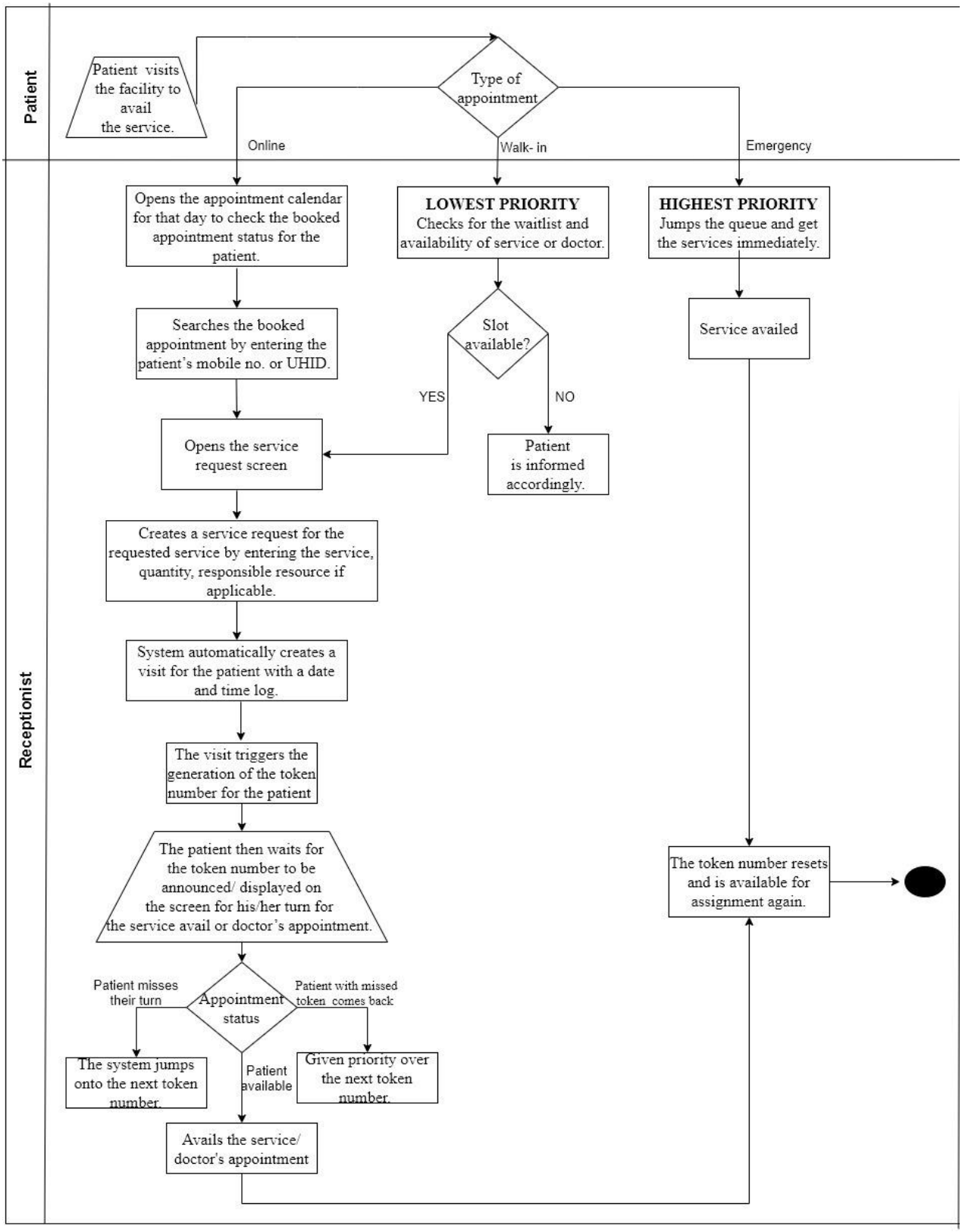
This microservice deals with various functionalities for managing patient queue in the primary care and specialist care setting. Patient Queue management is an important and critical process to efficiently manage the patient's and doctor's time, and effectively manage institutional processes and resources.

1.4. Business Process Flow for patient waitlist generation function

Description	The "Patient waitlist" service or function is utilized at multiple places in a hospital workflow and is a reusable function by multiple service rendering microservices or modules. It is critical to manage patient/service waiting time and for optimal utilization of available resources as per the patient footfall in a facility. Usually patient waitlist is managed by a workflow engine which can be configured as per the service category or type and can generate or trigger generation of patient for the respective users/departments/module. For example: For a lab test the patient's que will be generated for the billing dept/module user first, once billed another patient que will get generated for the lab department , followed by patient que as per the configured lab workflow.
Users	• Receptionist/Billing executive/admin • Hospital Department Admins
Pre-requisites	• An appointment has been scheduled
Business Process Details	**Use case 1 – Patient waitlist generation against a prescheduled appointment for a service/patient** In this scenario, a patient had requested an appointment for a specific service and the same patient will be seen in the service/patient waitlist of the respective billing /admin user role or module to take further action on. The same patient for which an appointment has been scheduled will be seen in the department's/user's waitlist. A patient waitlist against a scheduled appointment is not a confirmed waitlist unless a service request has been generated for that service on patient's arrival. It is only used for estimating the patient footfall on a given day or time and to plan the day's activities in advance.

	This scenario may not require a patient to be registered prior to his/her actual visit, but for creation of actual patient waitlist for the department or user who will be responsible for rendering that service patient registration **Use case 2 – Patient waitlist generation against a Service request or Bill generation** In this case a service request or bill gets generated for a service which triggers generation of a patient waitlist for the respective department. In this scenario a service can requested by the patient on arrival or a payment could have been made via an online platform or mobile app. A visit or service can be requested against a department for example lab test or can be requested against a resource in case of radiology investigations and consultation services. Once a visit is created for a patient it triggers a worklist for the respective department, service category and resource. The scheduled appointments can be filtered and specific patient queues gets created for every department/service category/resource. For e.g., in the case of the radiology department, there will be different queues for CT scan, MRI and X-ray. Similarly, in the case of consultations, there will be a separate worklist for each department and each consultant will have its own specific worklist.
Steps	• ***In case of scheduled appointment***, • A patient who has a scheduled appointment visits the facility to avail the service. • The receptionist/admin opens the appointment schedule for that day and enters the patient details (UHID/alternate id or any other patient detail) • The patient arrival is marked with a date and time stamp and the patient reflects in the queue against the specific department, service category and resource. Each department, service category, and resource will have its own patient queue. • Marking the patient's arrival may also trigger the generation of token numbers (the token number is generated only on the physical arrival of the patient). • ***In case of walk-in patients*** • The patient arrives at the healthcare facility. The receptionist/admin opens the appointment schedule, and based on the time of their arrival creates a service request by entering the preferred department, preferred service category, and availability of resources. • The patient visit is marked which may generate a token number (in the case of the systems which follow a token number) • The patient reflects in the queue against the specific department, service category, and the resource. Each department, service category and resource will have its own patient queue. • The service request made also triggers the billing worklist for payment. **In case of emergency cases, their emergency status has to be marked at the time of arrival. Only the emergency cases jump the queue, and are given the highest priority.*
Outputs	• Queue Token Number • Service ID
Messages & Alerts	• Message to relevant provider/ department for service id of the same patient • Message to patient/ family member for the service id and status.

1.5. Visio for the Patient Waitlist:



1.6. Required MDDS Data Elements:

1. Entity: Generic

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Time	05.001.0001	hh:mm:ss	8	
Date	G00.01	dd/mm/yyyy	10	
Alternate Identifier	05.001.0004	Varchar	254	
System of Medicine	05.001.0022	Integer	2	CD05.030

2. Entity: Person

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Unique Health Identification Number	G01.01	Integer	12	
Alternate Unique Identification Number(UID)	05.002.0002		Max. Size=18 10 -PAN Card 08 -Passport No. 18 -Voter ID 18 -Any other Identifier	
Person Name	05.002.0031			Refer to G01.02

3. Entity: Patient

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Patient Name	05.003.0002			Refer to G01.02
Patient Class	05.003.0013	Integer	2	Refer to CD05.047
Patient Arrival Time	05.003.0014	HH:MM:SS	8	
Patient Arrival Date	05.003.0015	dd/mm/yyyy	10	Refer to G00.01

4. Entity: Provider

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Unique Individual Health Care Provider Number	05.005.0001	Varchar	18	
Health Care Provider Name	05.005.0009			Refer to G01.02
Health Care Provider Type	05.005.0012	Integer	2	CD05.010

5. Entity: Facility

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Facility National Identification Number	05.008.0001	Integer	10	Refer to CD05.001
Facility Service Code	05.008.0009	Varchar	18	Refer to CD05.043
Department Name	05.008.0015	Varchar	99	Refer to CD05.090
Facility Global Unique Identifier (GUID)	05.008.0025	bits	16	

6. Entity: Episode

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Episode ID	05.009.0001	Varchar	50	
Episode Type	05.009.0002	Integer	1	Values: 1 - New 2 - Ongoing 3 - Active 4 - Inactive

7. Entity: Encounter

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Encounter ID	05.010.0001	Varchar	18	
Encounter Type	05.010.0002	Integer	2	Refer to CD05.047
Encounter Time	05.010.0004	HH:MM:SS	8	

8. Entity: Bill

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Bill ID	05.007.0001	Varchar	50	50
Bill Date	05.007.0002	dd/mm/yyyy	10	G00.01
Payment type	05.007.0009	Integer	1	Values: 1-Cash 2-Credit
Service Type	05.007.0008	Integer	2	Refer to CD05.080
Service Item Price	05.007.0019	Varchar	99	Refer to CD05.027
Package Item Name	05.007.0020	Varchar	99	Refer to CD05.028
Package Item Price	05.007.0021	Decimal (10, 2)	10	Refer to CD05.028
Quantity of Service	05.007.0022	Varchar	50	
Total Billed Amount	05.007.0024	Decimal (10, 2)	10	

1.7. Business Process Flow for waitlist management/configuration function:

Description	A patient waitlist service should be designed to accommodate walk-in as well as prescheduled appointment patients based on the time of their arrival and the availability of the specific service or resource. Normally a patient waitlist or que management function is configurable at the facility level where an admin user can create master definitions per slot available for different type of services with predefined number of patients that can be accommodated per slot as in how many appointments based patients can be accommodated and how many walk ins can be accommodated in the given available slot. These details were covered as part of the "appointment & scheduling microservice".
Users	• Admin User
Pre-requisites	
Business Process Details	The que or patient waitlist management covers the following functions: **1. Managing walk-ins** The walk-in patients are queued against the non-arrived scheduled patients. The walk in definitions or how many walk ins can a service slot can accommodate are defined before hand under the scheduling module and can be configured again using the master configuration screens whenever required or whenever a new service gets added to the facility's service list. **2. Prioritizing patients in the waitlist** A billing/receptionist user can make a patient jump the que when a service is requested as emergency or stat that will ensure the department/doctor first looks after the emergency patients who need attendance before other patients in the waitlist. **Patient waitlist in preservice billing scenario** In facilities that follow a preservice billing workflow, a patient que against the appointment will be first generated for the reception/admin user/module so that related actions can be taken on the patient que once patient actually arrives at the facility. In this case a separate patient arrival service may not be required as the service billing will auto generate a patient wait list for the respective user role/department/module. **Patient waitlist in post service billing scenario** On the other hand, in a post service billing scenario a separate patient arrival service won't be required, as the bill generation against the patient's UHID can trigger creation of a patient waitlist for the respective user role/module/department for service rendering.

	As soon as the patient arrives at the healthcare facility the patient's arrival is marked against the specific service the patient wants to avail of from the healthcare facility.
Steps	• ***In case of scheduled appointment,*** • A patient who has a scheduled appointment visits the facility to avail the service. • The receptionist/admin opens the appointment schedule for that day and enters the patient details (UHID/alternate id or any other patient detail) • The patient arrival is marked with a date and time stamp and the patient reflects in the queue against the specific department, service category and resource. Each department, service category, and resource will have its own patient queue. • Marking the patient's arrival may also trigger the generation of token numbers (the token number is generated only on the physical arrival of the patient). • ***In case of walk-in patients*** • The patient arrives at the healthcare facility. The receptionist/admin opens the appointment schedule, and based on the time of their arrival creates a service request by entering the preferred department, preferred service category, and availability of resources. • The patient visit is marked which may generate a token number (in the case of the systems which follow a token number) • The patient reflects in the queue against the specific department, service category, and the resource. Each department, service category and resource will have its own patient queue. • The service request made also triggers the billing worklist for payment. **In case of emergency cases, their emergency status has to be marked at the time of arrival. Only the emergency cases jump the queue, and are given the highest priority.*
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1.8. Business Process Flow for Patient Arrival function:

Description	Marking a patient's arrival is an important function of patient waitlist/que management or /schedular service. Marking a patient arrival is critical to actual assess the patient's actual waiting time at the healthcare setting to be able to avail a service. A reduced or minimum waiting time has also been considered an important quality parameter that supports a facility's operational efficiency.
Users	• Receptionist
Pre-requisites	• An appointment has been scheduled for the patient • A service request has been created for a patient

Business Process Details	The first touch point when a patient arrives at a facility to avail a service is the reception or billing counter. If an appointment was scheduled the reception user would be able to see the patient in the waitlist to confirm the patient arrival and check in to the respective department for availing a service. As soon as the patient arrives at the healthcare facility the patient's arrival is marked against the specific service the patient wants to avail of from the healthcare facility. This will create a time and date stamp for patient arrival time to actual service rendering time and will be utilized to assess the service waiting time per patient. Marking a patient's arrival is also important to intimate the respective department/user about the service confirmation for the patient in the waitlist that the patient has actually arrived. Note: Patient Arrival function is also covered in detail under "Visit management" microservice.
Steps	***In case of scheduled appointment***, • A patient who has a scheduled appointment visits the facility to avail the service. • The receptionist/admin views patient waitlist in their dashboard. • Selects the patient for whom arrival has to be marked and a patient's arrival is marked with a date and time stamp and the patient reflects in the queue against the specific department, service category and resource. Each department, service category, and resource will have its own patient queue. • Marking the patient's arrival may also trigger the generation of token numbers (the token number is generated only on the physical arrival of the patient). ***In case of walk-in patients*** • The patient arrives at the healthcare facility. • The receptionist/admin creates a service request/bill for the patient by entering the preferred department, preferred service category, and availability of resources. • In this case a patient arrival is automatically marked which may generate a token number (in the case of the systems which follow a token number) • The patient reflects in the queue against the specific department, service category, and the resource. Each department, service category and resource will have its own patient queue. **In case of emergency cases, their emergency status has to be marked at the time of arrival. Only the emergency cases jump the queue, and are given the highest priority.*
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