Title:	Reference number: 10665/M/BL, Annex 3 - Key Technical and Functional Requirements		
Req#	Details	Compliance (Non-compliant / Partial-compliant / Full-compliant)	Supporting Document (please indicate file name where applicable)
1	**CTM Background**		
1.1	Established in October 1981, CTM is the leading telecom service provider in Macau offering a full range of telecommunications services including mobile prepaid, mobile postpaid, fixed telephony, fixed broadband, fixed leased line, enterprise services etc. CTM is also offering a wide variety of telecom products and caring customer services through various channels.		
1.2	To support CTM strategic vision of driving digital transformation and delivering seamless, customer-centric experiences, evaluation is undergoing with the aim to either upgrade the existing billing solution or acquire a new, state-of-the-art one. The envisioned system must robustly support our diverse service portfolio, offerings, with capabilities for both real-time and offline charging etc. Additionally, the solution must be scalable, flexible, and aligned with emerging industry standards to ensure long-term operational efficiency and adaptability to future market demands. The target system should support business scopes stated within this document. The functional scope includes charging (online and offline), billing, invoicing and payment, CDR mediation and provisioning.		
2	**Business Scope**		
2.1	**Mobile prepaid service**		
2.1.1	Real-time balance management and usage tracking for services the subscriber has.		
2.1.2	Real-time rating for voice, SMS, and data based on predefined plan or value-added services.		
2.1.3	Instant top-ups, validity periods, and promotional offers.		
2.1.4	Some Specific services apart from general prepaid card features:		
2.1.4.1	Data volume transfer between prepaid customers of selected tariff plans, with certain service charge.		
2.1.4.2	Data/voice/SMS/MMS etc. usage plan/package sharing local usage and usages of selected roaming destinations.		
2.1.4.3	**1 SIM Card Multi Number service**: The mobile service SIM is provisioned with additional non local mobile numbers apart from the default local MSISDN (these MSISDNs are called secondary numbers).		
2.1.4.4	**Postpaid refills prepaid account**: Postpaid customers can be configured to link to certain number of prepaid cards for top-up from the postpaid account to the linked prepaid cards.		
2.2	**Mobile postpaid Service**		
2.2.1	Data rating should be real-time and offline rating capable, other service ratings can be offline;		
2.2.2	For some specific services/service packages, automatic re-rating is required if the volume usage package of a service is subscribed in the middle of the validity period;		
2.2.3	Some specific services apart from general mobile postpaid services:		
2.2.3.1	Data/voice/SMS/MMS etc. Usage Plan/package sharing among local usage and usages of selected roaming destinations.		
2.2.3.2	**Roaming Data Daily Pass Package:** This package is valid for a 24-hour period from the 1st data session or pre-configured 24 hours fixed time.		
2.2.3.3	**Multiple-day Roaming Volume Pass Package:** Provides a predefined volume of roaming data along within a group of roaming operators with specified number of days.		
2.3	**Fixed telephony**		
2.3.1	Fixed telephone Line		
2.3.2	Centrex (Centralized Exchange)		
2.3.3	Group Hunting		
2.3.4	Voice over Broadband fixed telephone line		
2.3.5	E1 voice service		
2.3.6	International Call Divert (ICD) Service		
2.3.7	International Toll Free Service		
2.3.8	Direct Dial-In service etc.		
2.4	**Fixed leased line**		
2.4.1	Supporting three primary connection topologies (point-to-point and point-to-multipoint, and multipoint-to-multipoint) for customers, offering guaranteed bandwidth.		
2.5	**Fixed broadband service**		
2.5.1	Broadband Internet with/without fixed IP address		
2.5.2	Dedicated Internet Access (DIA)		
2.6	**Enterprise projects and services**		
2.6.1	Various managed services, cloud solutions, and business operations etc.		
2.6.2	Project-based billing with one-off charges, recurring service charges, subscription fees, usage-based charges, or hybrid models.		
2.6.3	Support multi-site billing, and departmental cost allocations.		

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3	**Function Scope**		
3.1	**Real time charging**		
3.1.1	All Mobile service: voice, SMS, data, MMS, IMS, WiFi, Roaming service, and other VAS.		
3.1.2	Support SS7 based interfaces (CAMEL, INAP, MAP).		
3.1.3	Real-time charging via interfaces such as 4G/5G Diameter Gy, CAMEL, SOAP API, INAP, gRPC, Radius, or CHF etc.		
3.1.4	Integration with PCRF via Sy interface.		
3.2	**Offline charging**		
3.2.1	Handles typical transaction types Voice, Data, SMS, MMS, WiFi, service, and VAS etc.		
3.2.2	CDR Aggregation and Splitting.		
3.2.3	Late CDR Processing and failed CDR Reprocessing.		
3.3	**Billing**		
3.3.1	Product catalogue for different bundles, discount models for different group of customers, dynamic discounts based on different criteria, automated rebates & penalties based on different criteria: customer type, customer group, customer service tenure, product rent, product purchased, special event, subscribed tariff, subscribed services, and combination of these criteria etc.		
3.3.2	**Billing Cycle**		
3.3.2.1	Allow setup of monthly, quarterly, annual or other time-interval billing cycles.		
3.3.2.2	Each bill cycle has a standard start date and cut-off date by default. But customers of same bill cycles may also be allowed to have different bill-start date and cut-off date.		
3.3.3	The billing schedule operates independently of the service usage period, enabling asynchronous alignment between billing and service cycles.		
3.3.4	Allow different customers select billing in advance or billing at rear.		
3.3.5	Support pro-rate charging and billing based on different tariff plan and service.		
3.3.6	Allow simulation of whole billing process to test or verify functions or tariff settings etc.		
3.3.7	**Charge re-direction between different customers**		
3.3.7.1	Support partial/full liability redirection.		
3.3.7.2	Support time-bound or usage-based liability redirection.		
3.3.7.3	Support percentage /minimum /maximum liability.		
3.4	**Mobile Roaming process**		
3.4.1	Support data exchange via TAP 3.11/3.12 and BCE standards with roaming partners.		
3.5	**Invoicing/Payment**		
3.5.1	Support different invoice formats, such as HTML, PostScript, and PDF etc.		
3.5.2	Support different payment channels.		
3.6	**CDR collection & mediation**		
3.6.1	Provide a mediation solution for processing network Call Detail Records (CDRs) to support customer charging, interconnect/settlement billing, reporting, and other work streams.		
3.6.2	To integrate with Network elements or other third party system via SFTP/FTP/FTAM/X.25/File tail/API for source files collection /decoding /transformation and delivering result files to different downstream systems.		
3.7	**Service provisioning**		
3.7.1	Support real-time and batch service provisioning to different network elements with proper synchronization among different network nodes, service nodes and workflows.		
3.8	**API Interface with front-end CRM system**		
3.8.1	Real-Time and batch data exchange between this new system and CTM's own CRM system with both transactional and enquiry data bi-directionally.		
4	**Implementation**		
4.1	The solution should be a turnkey solution, including hardware, software. If the solution is running cloud based platform, the cloud platform is not part of the delivery, please list the resources detail requirement and specify how to guarantee compatibility between the solution and the cloud platform in the lifecycle of the implementation in CTM.		
4.2	Implementation also includes interconnect/integrate with all existing systems in CTM environment, upstream/downstream systems.		
4.3	Service/Data migration to new/upgraded solution.		
4.4	Project implementation lead time should not exceed 18 months, counting from the contract award to the new system goes live in production and all data/service migrations from old system to new system have been completed successfully.		

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5	**System Support**		
5.1	SLA for different level of incidents, including response time, recovery time etc.		
5.2	System Security patching		
5.2.1	Critical security patches deployment arrangement.		
5.2.2	Regular security patch deployment arrangement.		
5.3	Software upgrade/update (application software, OS, database, middleware etc.)		
5.3.1	Regular updates arrangement to baseline software.		
5.3.2	If the new version of software has compatibility issues with the application software, the contractor is responsible to fix these issues.		
5.3.3	Compatibility assurance with existing customizations and integrations.		
5.4	All customized or newly developed (during implementation) source program codes, scripts, and documents should be shared with CTM and CTM has the right to use/modify/further develop based on these delivered source codes, scripts and documents.		
5.5	Should provide support to all components of the system including all hardware and software components at least 8 years after the system goes live. Guaranteed availability of spare parts and software updates.		
6	**Submission requirement**		
6.1	Submission should provide an overall solution description and architecture including necessary components and sub-systems and proposed time schedule of the whole project.		
6.2	Submission should include the target systems' (and associated sub-systems') documentation and other technical documentation, but not limited to system installation manuals, system configuration/administration manuals, database dictionaries, which can provide enough technical details that the specified services and functions are met satisfactorily		
6.3	For each specific service / function, should list corresponding document sections which fulfill this requirement if the production itself can provide such capability; if the services/functions should be implemented via customization of existing products or newly developed functions, high level explanation on how to achieve this should be stated.		
6.4	It is welcome to include other additional functions and features beneficial to our operation and business development.		

CTM reserves the right to the final interpretation of the content and items stated above. For any queries, please contact CTM for clarification.