Quotation Management and Pertinent Information Tracking System with Expenses Analysis for a Government Institution

23	Deltin C. K.	IDK23CS023
30	Hathim Ali K. H.	IDK23CS031
48	Roshan Jose	IDK23CS049
59	Srishanth S.	IDK23CS060

Dept. of Computer Science and Engineering
Govt. Engineering College Idukki

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Quotation Management and Pertinent Information Tracking System with Expense Analysis for a Government Institution (hereafter referred as QMS) aims to trivialize the procedures involved in requesting a quotation, reaching a mutual agreement, and the exchange of considerations for an institution. When the institution posts a quotation, the relevant registered vendors are notified who respond with inventory specifics and a prescribed price (open to negotiation through QMS). The institution exercises its discretion to choose a vendor, which the vendor acknowledges and receives payment (conducted within QMS with a payment gateway) and prompty dispatches the item of concern. To ensure that the item was delivered, an OTP is generated by the vendor for the institution with QMS which the institution must supply to the software (assuming the sane course of action is to supply the OTP only once the items have indeed arrived). The complete transaction in detail and history are archived by QMS, these data being available for later analyses (to draw financial conclusions and audits &c.), and are exportable. The frontend is achieved using `Next.js/React`, the backend using `Python/Django`, and `SQLite` or `PostgreSQL` as the database management system in anticipation of scaling issues.

The primary focus of this endeavour is to electronically *formalize* the sequence of procedures comprising a usual invitation of quotation and the ensuing transactional technicalities. More concretely, we wish to (a) easily notify interested (i.e. registered) vendors; (b) collect quotations and painlessly review each of them because quotations here are not enclosed letters or like documents; (c) archive the points of reason come up during consideration for provision under RTI 2005; (d) guarantee payments and goods hand-over and record; (e) archive the complete transaction and make it available for later review and analyses (for the accountants, managers, &c.).

We assume that the vendors interested in obtaining a quotation from a government institution will register themselves in this software system under the institution's name, because even without it these vendors are always turning an ear to notifications released from the institution through other media, say, the institution's website or classifieds. A vendor registering should ideally go through a procedure of submitting legal documents and proofs relating to their practices, incorporation, &c., however this is not a primary focus and is deferred. These registered vendors are notified through the software (or maybe also mail) when a quotation is invited by the institution, and they will send in their quotation within this software if they wish to obtain a contract.
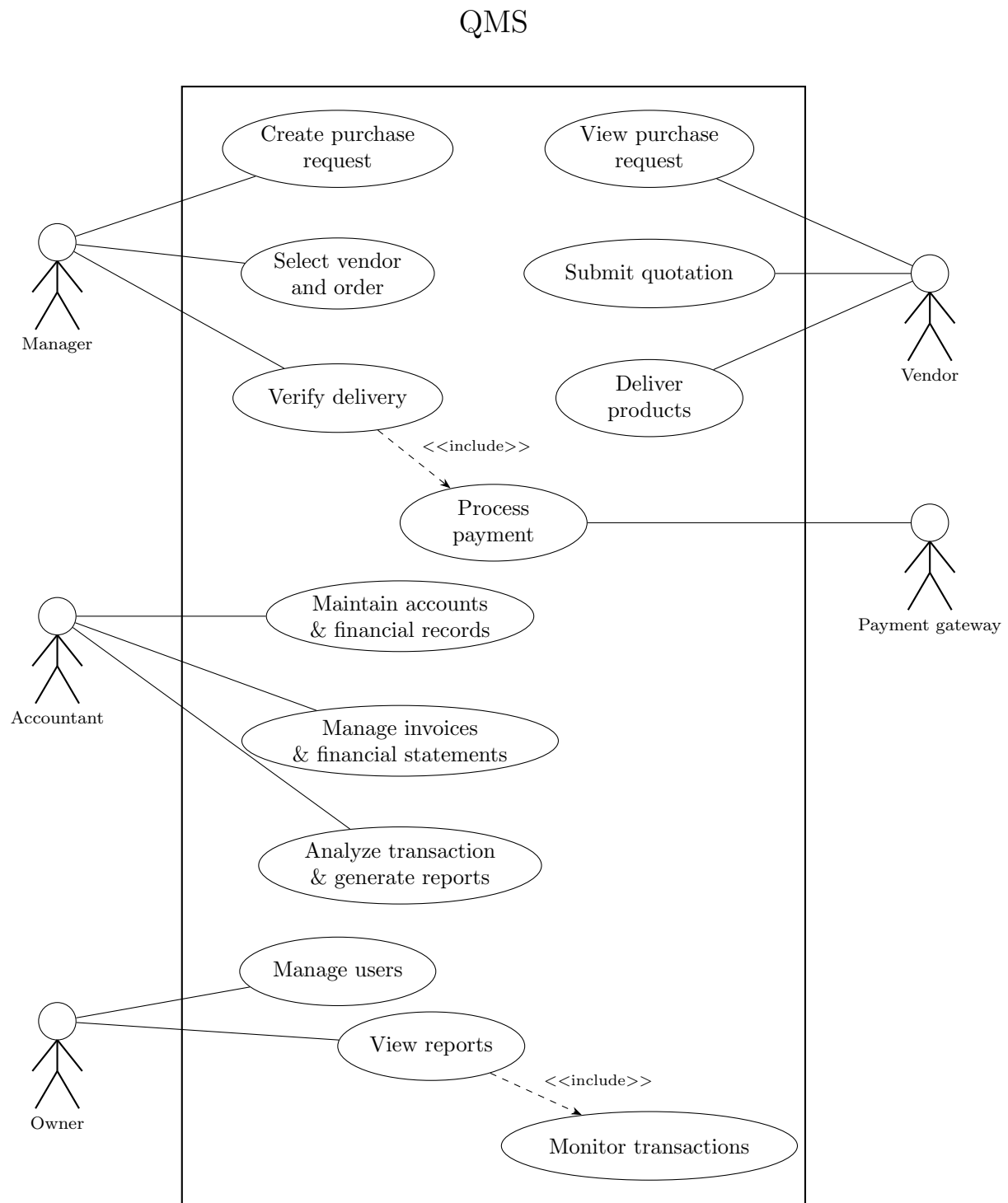
The review of submissions are had after a set interval wherein these vendors are to submit their quotations. After the lapse of this interval, the submissions are considered and to tolerate any late ones falls under the discretion of the institution. These can be classified into four according to the requirements and preferred price of the institution:

- RP — requirements and price met;

- RP' — requirements met, but not price;

- $R'P$ — price met, but not requirements;
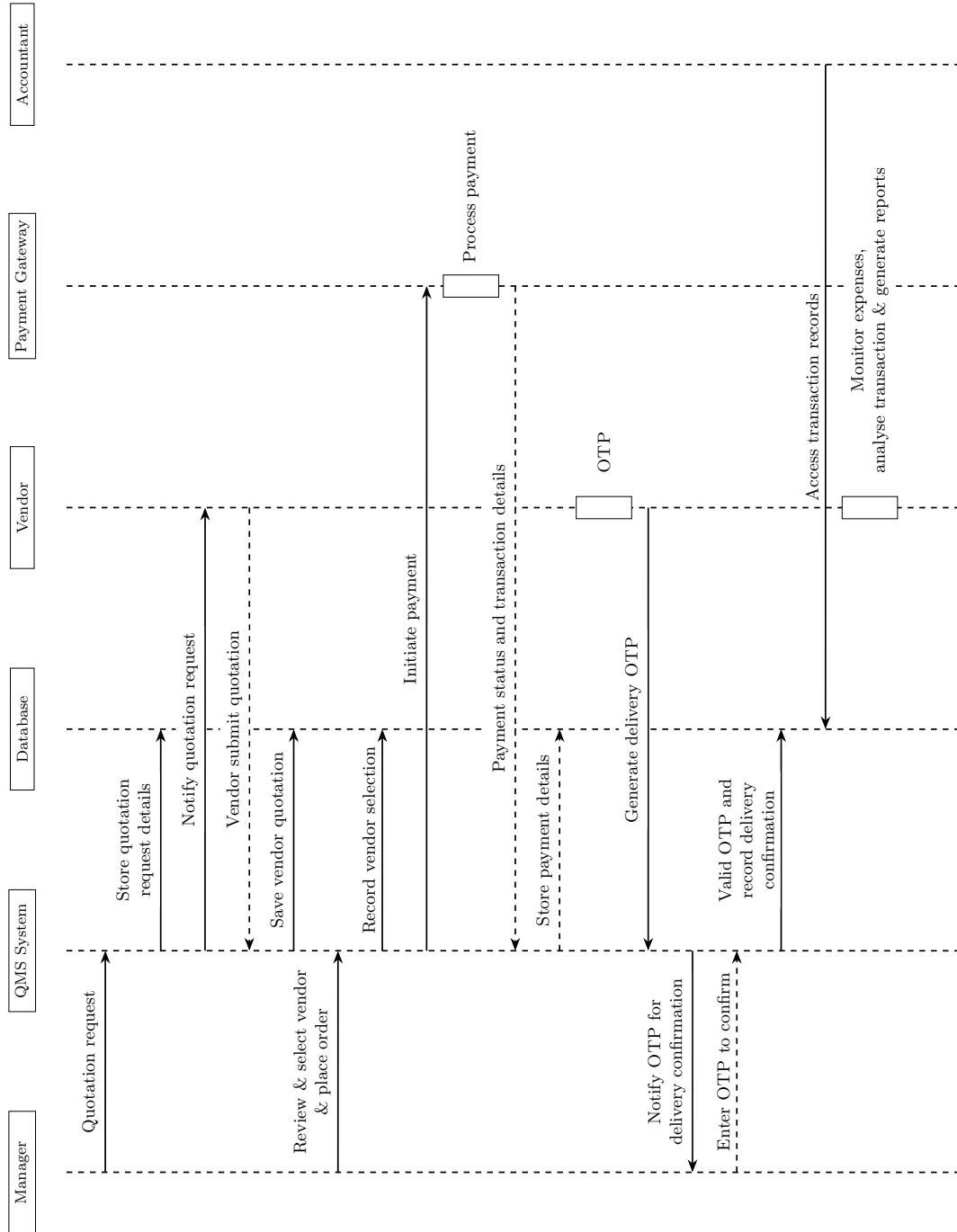
- $R'P'$ — requirements and price not met.

No further consideration is done upon $R'P'$ and they are eliminated. The other three categories are more nuanced, for instance, the institution might prefer a submission that deviates lightly (not negligible) but has a far lower quoted price. The submissions are listed according price as L1, L2, L3, &c., L1 being the lowest.

In the case that L1 is not chosen, a valid reason for the same must be mandatorily supplied. When a vendor demands the decisions behind why their quotation was rejected under RTI 2005, the information can be expediently dispatched.

The software also takes care to guarantee that payment and delivery have occured. The payment is guaranteed by utilizing a payment gateway; this additionally automates and relieves difficulties associated with payments. The delivery i.e. the hand-over of the goods of concern are guaranteed to have actually occured using an OTP generated by the software at the input of the vendor which is then reentered into the software by the institution. We assume that the institution is only willing to reenter this OTP back into the software in the event the goods of concern have indeed been handed over.

QMS

Figure 1   Use-Case Diagram.

Figure 2 Sequence Diagram.

When the quotation and its transaction are finalized, the whole detailed history is archived in the system. The history is viewable through the software for actors with required privileges, their privilege dictating what and how much they can view. One significant actor is the accountant, who can draw conclusions from the archived data through primitive analysis tools provided in the software. For further advanced review, the data are exportable in a few appropriate formats (JSON, XML, &c.); they can be fed into other software tailored for such uses.

What this software system attempts is a digital formalization of the quotation process in a government institution and ease the pain points encountered and morever provide crytpgraphic security, reliability, and verifiability.

Dated 2026–1–1   Dr Sunil K. S.