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Analysis Postponed VAT Feature on Invoicing Module of Odoo 16 using Rapid Application Development

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Abstract

The postponement of Value Added Tax (VAT) payment is a policy aimed at easing financial burdens for companies that frequently import goods, as it allows businesses to defer tax payments instead of prepaying them during imports, thereby improving cash flow and reducing operational costs. This study explores the implementation of VAT payment postponement in the Odoo 16 Invoicing module using the Rapid Application Development (RAD) method, chosen for its rapid iteration and prototyping capabilities to meet user needs and regulatory changes efficiently. By modeling an importing company's business process in Odoo 16, the research implements and tests the VAT postponement feature, assessing its effectiveness in streamlining operations and enhancing financial flexibility. The study also evaluates the RAD method's efficiency in development and deployment, providing insights into the integration of fiscal policies with corporate IT systems to bolster operational performance and global competitiveness.

Keywords: Odoo ERP, Postponed VAT, Rapid Application Development

INTRODUCTION

Following the UK government's decision to exit the European Union, importers were obliged to pay VAT when goods entered the UK if their value exceeded a certain threshold after the transition period ended on January 1, 2021. The goal of the tax payment deferral policy is to lessen the impact on cash flow during the import process by allowing importers to postpone their tax payments. The purpose of this study is to examine and evaluate how the Enterprise Resource Planning (ERP) system has been modified to accommodate the tax payment deferral policy. Odoo is one of the ERP software options that are currently available. There is no licensing fees associated with using Odoo because it is open-source software. Odoo was created in Python and streamlines the development process to satisfy the requirements. It is also compatible with multiple platforms, allowing it to run on various operating systems.

The open-source, integrated ERP used in this study is Odoo 16, which was created with XML and Python. The invoicing module and a customization module are needed for this study to offer tax payment deferral features on purchase invoices. In this study, the required modules will be implemented to develop the Odoo ERP system using the Rapid Application Development (RAD) method. Iterative development and rapid prototyping are key components of the RAD software development methodology. This approach is intended to reduce the amount of time needed for system design, implementation, and planning.

According to several studies on the use of the RAD method in Odoo implementation, this approach gives businesses greater flexibility in how they structure and modify their ERP modules. The RAD approach is ideal for dynamic business environments that need ERP solutions that can be quickly customized without sacrificing system quality, according to a study by Sweeney and Winn. Faster iterations and instant feedback during the development phase result in higher user satisfaction levels, and another study shows that RAD can cut implementation time in ERP development by up to 40% when compared to waterfall methods. Recent research confirms the effectiveness of RAD in developing ERP systems that adapt to changes in tax regulations, such as Postponed VAT, positively impacting operational efficiency and compliance. Additionally, research indicates that applying the RAD method in ERP not only accelerates the development process but also enhances flexibility and adaptability to new policies, relevant to implementing the VAT deferral feature.

The development of the tax payment deferral feature in the Invoicing module using the RAD method and performance testing of the final system will be the main objectives of this study. In accordance with the UK government's Postponed VAT policy, this custom module will be made to give users flexibility when managing tax transactions on purchase invoices. To make sure the developed module not only works well but also offers substantial advantages in cash flow management and tax compliance, the testing process will simulate actual business scenarios.

All things considered, this research helps create an Odoo-based ERP system that is more adaptable to modifications in tax laws and provides a more effective development process by utilizing RAD. It is anticipated that other developers and organizations seeking to deploy ERP solutions with high flexibility and quick implementation times will find the study's practical experience and testing results to be a valuable resource.

METHOD

The Rapid Application Development (RAD) method is used in this research, which takes a quantitative approach to the development process. This method was chosen because it can speed up development and allow for iterative testing based on real-time user feedback. The requirements planning, design, development and customisation, and testing phases are all included in the RAD process. Automated unit testing will also be incorporated into the development process at this phase.

1. Research Design

The quantitative approach uses the Rapid Application Development (RAD) method to assess the results of the tested Odoo 16 system, with a particular emphasis on the Postponed VAT feature using Unit Testing. Software testing employs this technique to verify that all the system's functional components operate as planned. The research design's goal is to generate numerical data that can be utilized to assess the effectiveness of the suggested Postponed VAT function.

Finding the functional units for testing, such as the deferral process for tax payments, invoice validation, and the computation of postponed VAT, is the first step in the research process. Using automated testing scripts and tools like Unittest or Pytest, which are incorporated into the Odoo 16 development environment, these units are independently tested.

The number of units tested, the test success rate, and the number of faults found are among the data gathered throughout the testing phase. The performance of the Postponed VAT feature is objectively evaluated by quantitatively analyzing the test results. To determine which sections of the feature's development need improvement, the number of mistakes or problems found during testing is also assessed. The customization module was developed in accordance with the OCA's (Odoo Community Association) requirements.

2. Research Procedure

2.1. Requirement Identification

The Invoicing module in Odoo 16 includes several features, such as sales invoice creation, billing and payments, as well as recording and managing tax-related activities. Based on various reference journals regarding the tax payment deferral policy, an analysis was conducted on the affected business processes and the functional requirements needed to accommodate the Postponed VAT feature. Below are the business processes present in the Odoo Invoicing module, along with the addition of the Postponed VAT feature.

2.1.1. Analysis of the Vendor Bill Business Process in Odoo

An explanation of the business process is provided, followed by an illustration in Fig 1. below.

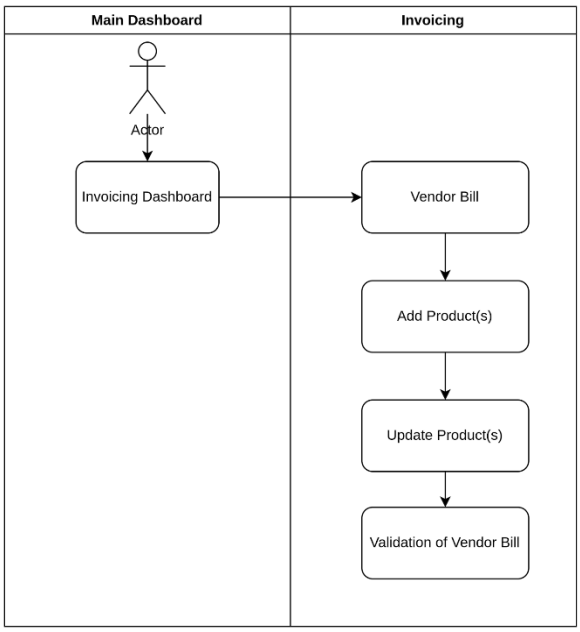

Fig 1. Business Process of Vendor Bill Postponed VAT

Fig 1. illustrates the workflow process of the Odoo system in the Invoicing module for creating and confirming a Vendor Bill. The process managed by the Odoo system is straightforward: once confirmed, the status of the Vendor Bill changes to "Posted" and reflects a fixed value based on the products and taxes invoiced.

2.1.2. Analysis of the Vendor Bill Business Process in Odoo with Postponed VAT Feature

An additional explanation of the business process is provided, noting that the business process with the added Postponed VAT feature is illustrated in Fig 2. below.

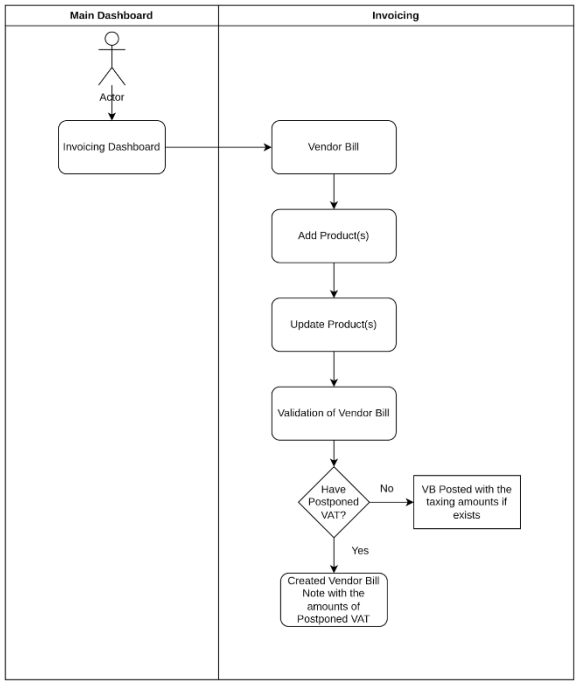

Fig 2. Business Process of Vendor Bill with Postponed VAT

Fig 2. illustrates the workflow of the Odoo system in the Invoicing module for creating and confirming a Vendor Bill. In the business process with the Postponed VAT customization, several adjustments to the workflow are outlined as follows. When a user selects and confirms a Vendor Bill containing products with Postponed VAT, a Vendor Bill Note is generated to reverse the VAT payment amount on the products of the Vendor Bill.

2.2. System Design

Business modeling entails changing Python code to satisfy the Postponed VAT feature's requirements, as shown in Fig 2. These changes introduce a business process for generating a Vendor Bill Note, or reverse entry, which serves as a reversal for any invoices including goods that are subject to postponed VAT. An example of a vendor bill that includes a vendor bill note for these products may be found below. Data from a vendor bill with products that have postponed VAT is displayed in Fig 3. below.

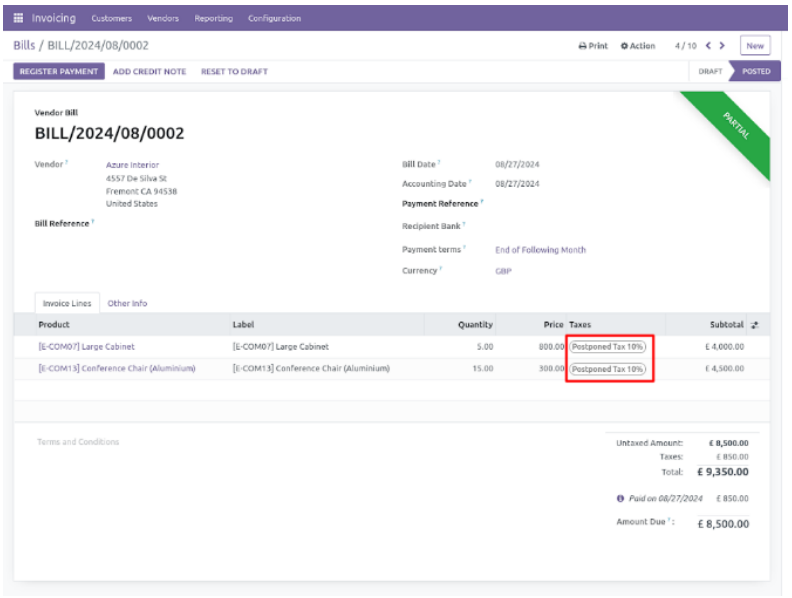

Fig 3. Vendor Bill with Postponed VAT's Product

A Vendor Bill Note that is connected to the original Vendor Bill is produced by the Postponed VAT computation for certain products. This procedure indicates that a portion of the Vendor Bill will be paid with the confirmed section.

2.3. Development and Implementation

The Postponed VAT feature is added to the Odoo 16 module by customization using XML and Python. Iterative development is carried out, adhering to customization rules from the Odoo Community Association (OCA), with an emphasis on prototyping to enable quick revisions.

The required development and customization are applied to the "account.tax" and "account.move" models. In the "account.tax" model, a column or field is needed to serve as a marker or flag to indicate whether the tax product is classified as Postponed VAT. Modifications to the "account.move" model are aimed at accommodating the business process that occurs when a user confirms a Vendor Bill containing products with Postponed VAT.

2.4. System Testing

To make sure every modification works as intended, testing is done using unit testing. Preparing the Postponed VAT, partner and product data, as well as preparing and verifying vendor bills with and without Postponed VAT, are among the units that are evaluated.

The test results, which include the number of tests ran, the tests that passed, and the tests that failed or encountered issues, are displayed as terminal logs from activities carried out using Odoo's Unit Testing feature.

RESULTS AND DISCUSSION

1. System Result

Depending on the modifications made, the Odoo system will identify any goods with confirmed Postponed VAT on a Vendor Bill and create a Vendor Bill Note, as shown in Fig 4.

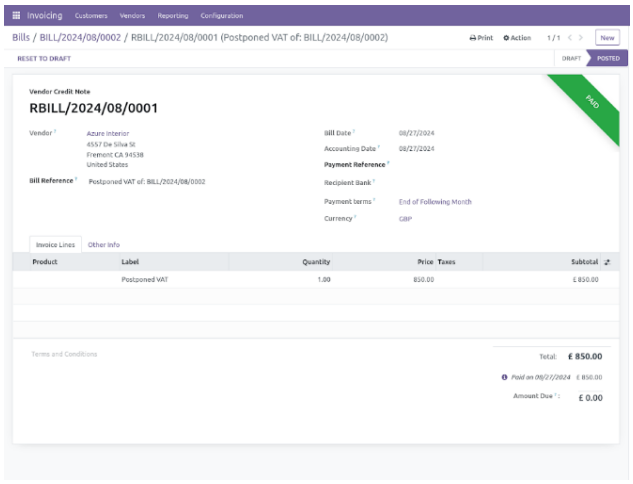

Fig 4. Vendor Bill Note created from a Vendor Bill that has Postponed VAT product(s)

The creation of a Vendor Bill Note with the value of the goods subject to Postponed VAT indicates the customisation outcomes for the Postponed VAT feature. Vendor Bill Note RBILL/2024/08/0001 is the Postponed VAT for Vendor Bill BILL/2024/08/0002, as illustrated in Fig 4. The system generates this Vendor Bill Note automatically based on the product in Vendor Bill BILL/2024/08/0002, which includes Postponed VAT.

2. Unit-Testing Result

The outcomes of the unit tests show that the modified Odoo 16 system—more especially, the Invoicing module with the Postponed VAT feature—is producing the desired outcome. Tax calculation, purchase invoice validation, and the confirmation that a Vendor Bill Note is issued if a verified Vendor Bill comprises products with Postponed VAT are among the functional units that were tested. As seen in Fig 5. below, the created unit-testing script generated terminal log output.

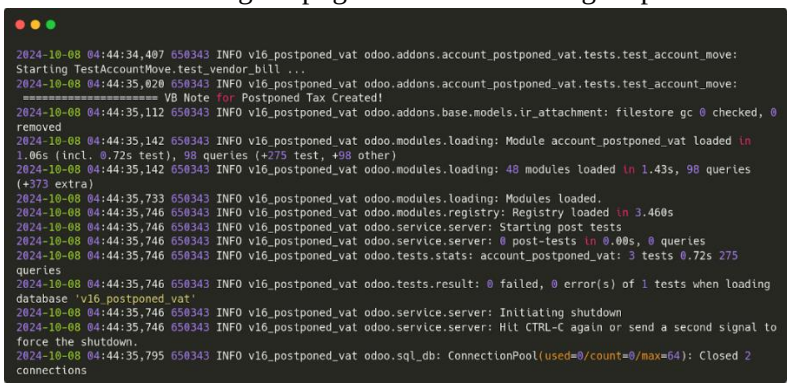

Fig 5. Unit-testing result from the Postponed VAT feature

3. Discussion

The Postponed VAT functionality in Odoo 16 operates as anticipated in accordance with the requirements, according to the testing results. Organizations can more easily apply the Postponed VAT policy in accordance with relevant rules, thanks to the flexibility available in the Odoo 16 Invoicing module. Regarding Postponed VAT in particular, this study offers a useful addition to the creation of an Odoo 16 ERP solution that complies with tax policy criteria.

CONCLUSIONS

Using the Rapid Application Development (RAD) methodology to implement the Postponed VAT feature in Odoo 16's Invoicing module has proven to be successful and efficient. The product was quickly adjusted to meet user expectations and the UK's Postponed VAT regulatory requirements thanks

to the iterative RAD process. Unit testing was essential to the development process since it made sure that every part worked as it should and confirmed that the feature was resilient generally and free of major faults. This testing verified that the tailored solution functions dependably and offers consumers a simplified method of handling VAT deferrals, all the while promoting compliance and better cash flow management.

The study showed how useful RAD is as a development methodology for ERP modification, especially when it comes to adjusting to changing regulatory environments. By including unit testing into every development iteration, high standards were maintained and timely problem solving was made possible, strengthening the final product's dependability. When paired with regular testing, RAD's flexibility and quick deployment allowed businesses to have an ERP solution that was both useful and flexible. For developers and businesses seeking to create flexible ERP systems that can adapt to shifting tax laws and more general business requirements, these findings provide a solid basis.

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