CUSTOMIZATION AND IMPLEMENTATION OF ENTERPRISE CONTENT MANAGEMENT INTEGRATED WITH SAP (A CASE STUDY APPROACH)

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ABSTRACT. *The purpose of this paper is to find out the problems related to Project Infrastructure and Non-Infrastructure Operations process, customize and implement Enterprise Content Management (ECM) integrated with SAP, and generate documentation during customization and implementation in PT XYZ. The methodology for data collection is interview and documentation study. Customization method used is OpenText Customizing Guide, while the implementation method is training, system conversion, and establish system support. The results obtained are ECM customized and implemented in accordance with the business needs of PT XYZ. The conclusion is that ECM integrates document storage with business processes enabling users to access relevant documents more quickly.*
Keywords: Enterprise Content Management, SAP, OpenText

1. **Introduction.** Enterprise Content Management is the management of unstructured content such as soft copy of documents, scans, images, emails, sound recordings, and videos within the organization. Enterprise Content Management encompasses capture, preserving and delivering content as an organizational asset in a consistent, natural, reusable way [1]. In organizations, content is produced annually in large quantities, so that the need arises to store, organize and present content efficiently [2]. If the data or information is not stored properly, the content in the system becomes redundancy and it is difficult to find and the accuracy of the information from that content diminishes because it is difficult to distinguish the old and recent versions [3]. With Enterprise Content Management that content can be stored structured into centralized storage and accessed using functionality such as search, retrieve, version, index, and archive [3].

Structurally stored content allows everyone to share information with each other, even if they do not know each other [3]. The Enterprise Resource Planning system has been used to integrate information and accelerate the distribution of information across all functions and departments in order to improve operational capability of organizations [4], but they forget unstructured information or contents that continue to grow company. Enterprise Content Management enables unstructured content to be used to assist the company's decision-making process by providing access to supporting documents previously used as a source of structured content or data [1].

PT XYZ is a supplier of wood raw materials for pulp and paper mills and has implemented Enterprise Resource Planning from SAP to support all business processes. PT XYZ is engaged in managing production forest areas that apply intensive forestry to meet the raw materials of the forest industry. PT XYZ has offices in Jakarta and manages six

industrial plantation companies operating on the islands of Sumatra and Kalimantan. PT XYZ is currently seeking to transform its business processes by undertaking project planning integration, i.e., integration between planning and project creation in particular is the integration between content or document storage with business processes in SAP. This transformation is needed by the company because the information system is not integrated yet, so it is difficult to access the required data quickly. Currently, the Technical Support Department (TSD), Contractor Management Service (CMS), and Finance Accounting Department (FAD) at PT XYZ use Plant Maintenance (PM), Material Management (MM) and Financial Accounting (FI) modules to create Project Infrastructure and Non-Infrastructure Operations such as building, road construction, heavy equipment rental, and site preparation services in SAP. Previously PT XYZ has implemented FTP server to store project related documents such as background project document, cost budget plan, tender request, soft copy of request for quotation, vendor price offer, soft copy of work order, progress documentation, soft copy of work contract, soft copy of invoice and payment. However, the FTP server is not integrated with SAP and its functionality is limited (no version control and cannot set permissions from documents or folders). From these problems arise the need for Enterprise Content Management systems that can be integrated with SAP. To meet these needs, the IT department at PT XYZ is working with ABC consulting firm to implement Enterprise Content Management from OpenText on PM, MM, and FI modules.

Before choosing OpenText, PT XYZ has a comparison of vendors to implement ECM systems including ELOenterprise, SharePoint, and Alfresco. Between OpenText and ELOenterprise, the features that are shared are the same, such as Document Management, Record Management, Collaboration, Workflow Approval, Permission, and Archiving. And by reviewing related enterprise content management studies, OpenText is selected because OpenText products are developed and tested in accordance with SAP defined standards, OpenText products can be purchased from SAP, and maintainability can be done through SAP support [5]. OpenText also has an agreement with SAP, which SAP resells OpenText products [6].

2. **Methods.** The research method consisted of data collection, customization, and implementation. First, the authors collect data to compile business solutions and know the needs of users that must be met. According to Satzinger et al. [7], data collection methods are interviews and documentation studies. Interview was done to each business process owner who really understands the process that is running. Documentation study was done by studying the documentation of the current process. Once the user needs have been identified, the author customizes the OpenText system accordingly. According to OpenText Corporation [8], the steps in the OpenText customization consisted of: creating property provider and search help, enabling business object declaration for business object type, creating classification, categories, workspace type, document template, group replacement, connection to external system, business object type and specify user permissions. After customization, the author performs system implementation in PT XYZ. According to Giachetti [9], the implementation was done by three stages of providing formal training to users and informal training to the IT team, cut-over or parallel system conversion, and provide support after the project is completed.

3. **Results and Discussion.** Enterprise Content Management will be implemented in the process of making Project Infrastructure and Non-Infrastructure Operations. SAP objects to be integrated are Maintenance Notification, Maintenance Order, Purchase Requisition, Request for Quotation, Vendor Quotation, Purchase Order, Purchase Contract, Measurement Document, Good Movement, Incoming Invoice, and Accounting Document.

3.1. **Identifying the company needs.** Based on the results of interviews and documentation studies, there are following needs.

- OpenText Content Server was implemented on corporate Intranet networks
- OpenText Content Server was implemented on DEV, QA, PROD servers following existing SAP architectures
- Each OpenText Content Server on each server will connect with SAP R/3 and SAP HANA
- Users will access OpenText Content Server via SAP GUI
- OpenText user will be integrated with Active Directory and SAP user so that user login using Active Directory login through website or SAP user through SAP GUI
- Users accessing OpenText Content Server come from seven regions: Jakarta (HQ), Bangka Belitung (BABEL), Jambi (JAMBI), West Kalimantan (KALBAR), East Kalimantan (KALTIM), Palembang (PALEMBANG), RIAU (RIAU).
- Business workspace will be stored in OpenText Content Server with the following folder structure:
  - Enterprise \ SAP \ <SAP server> \ <business workspace> \ <Region> \ untuk Maintenance Notification, Maintenance Order, Purchase Requisition, Request for Quotation, Vendor Quotation, Purchase Order, Measurement Document, Good Movement, Purchase Contract
  - Enterprise \ SAP \ <SAP server> \ <business workspace> \ <Region> \ <Company code> \ for Accounting Document and Incoming Invoice
- Business workspaces will be created by naming automatically as follows:
  - Maintenance Notification [Notification]
  - Maintenance Order [Order]
  - Purchase Requisition [Purchase Requisition]
  - Request for Quotation [Purchasing Document]
  - Vendor Quotation [Purchasing Document]
  - Purchase Order [Purchasing Document]
  - Measurement Document [Measurement Document]
  - Good Movement [Material Document] [Material Doc. Year] ([Movement Type])
  - Accounting Document [Company Code] [Document Number] [Fiscal Year] ([Document Type])
  - Purchase Contract [Purchasing Document]
  - Incoming Invoice [Invoice Document No.] [Fiscal Year]
- Subfolder at business workspace: Maintenance Notification, Maintenance Order, Purchase Requisition, Request for Quotation, Vendor Quotation, Purchase Order, Measurement Document, Good Movement, Purchase Contract, consisted: TSD, Harvesting, Plantation, Nursery, Others, CMS, All Related Items*.
- Subfolder at business workspace: Accounting Document and Incoming Invoice, consisted of: FAD, All Related Items*.
- Permission at OpenText Content Server, consisted of:
  - Group in OpenText Content Server: SMF_ADMIN, TSD [Region] Head, TSD [Region] Creator, CMS [Region] Head, CMS [Region] Creator, FAD [Region] Head, FAD [Region] Creator
  - The user whose position Head is inserted into the Head group
  - The user whose position Staff is assigned to the Creator group
  - Users will be entered into groups whose departments and regions are appropriate
  - The users of the IT team are inserted into the SMF_ADMIN group
  - Users in the respective regions cannot see business workspaces in other regions

- ○ Users in TSD department can make business workspace Maintenance Notification, Maintenance Order, Purchase Requisition, Purchase Contract, Purchase Order, Measurement Document, Good Movement
- ○ Users in the CMS department can create a business workspace Request for Quotation, Vendor Quotation, Purchase Order
- ○ Users in TSD and CMS departments can view business workspace Maintenance Notification, Maintenance Order, Purchase Requisition, Request for Quotation, Vendor Quotation, Purchase Contract, Measurement Document, Good Movement
- ○ Users in the FAD department can create business workspaces Incoming Invoices and Accounting Documents and view all other business workspaces
- ○ Users can only view, add and modify documents or content entered in their respective folders in a business workspace that they can see
- ○ SMF_ADMIN Group has all permissions to view, add, modify, delete content.
- ○ Users who want the document removed need to contact the IT team. Later the IT team will check the documents to be deleted whether the user really belongs.

* On the OpenText Content Server side, classification is made for each business object in SAP. Classification is used to categorize or specify types of business workspaces.

3.2. **Configuration steps.** First, we create a Property provider that is a class created in SAP to retrieve metadata from transactions in SAP to fit and display in OpenText Content Server. When creating the property provider for each SAP object, we inherit from the superclass provided by OpenText and then define the attribute for each SAP object. The attribute contains a list of fields from the SAP that we want to display in OpenText Content Server. In each property provider we create a GET_PROPERTIES method to retrieve metadata from the table in SAP into the class structure. The GET_PROPERTY_DEFS method is used to initialize the structure in the class. Property provider is created using the SAP GUI builder class (t-code SE24). Structure is used to group data elements or fields in an object. Structure is created using ABAP Dictionary in SAP (t-code SE11). Search help is a dialog menu to help users search for transaction numbers from a single SAP object when they want to create a business workspace in OpenText Content Server. Search help is created by using ABAP Dictionary in SAP (t-code SE11).

Next, the Business object that will be created workspace in OpenText Content Server is listed in business object declaration in SAP. For each business object it needs to be made property provider and search help. Business object declaration can be accessed by t-code SPRO, OpenText Extended ECM for SAP Solutions menu> Extended ECM> Maintain Business Object Declarations. On the OpenText Content Server side, a classification for each business object is created in SAP. Classification is used to categorize or specify the type of business workspace. Categories is the placeholder of a metadata or table field that is taken from the SAP property. The number of metadata taken from each SAP object is five to ten metadata. Length and metadata types follow the length and field type taken from SAP. The fields in each category of SAP objects follow the fields in the attribute of the provider property. Workspace type is a framework for business objects in SAP.

Because OpenText Content Server will connect to two SAP servers, a workspace type should be created for each business object on each server. To create a workspace type required directory folders, classifications, and categories. Document templates are defined for standardized business workspace creation in a uniform format. Document templates are created for each SAP object. Group replacement is used for permissions on business workspaces to be dynamically generated based on attributes taken in categories. For example, in document template, created FAD [Region] Creator group template, if user from region Riau makes business workspace, then group will automatically change to become FAD Riau Creator. Then, OpenText Content Server is associated with SAP server

TABLE 1. Access control matrix

	Maintenance Notification	Maintenance Order	Purchase Requisition	Request for Quotation	Vendor Quotation	Purchase Contract	Purchase Order	Measurement Document	Good Movement	Incoming Invoice	Accounting Document
SMF_ADMIN						View, Add, Edit, Delete					
TSD [Region] Head	View	View	View	View	View	View	View	View	View	–	–
TSD [Region] Creator	View, Add, Edit	View, Add, Edit	View, Add, Edit	View	View	View	View, Add, Edit	View, Add, Edit	View, Add, Edit	–	–
CMS [Region] Head	View	View	View	View	View	View	View	View	View	–	–
CMS [Region] Creator	View	View	View, Add, Edit	View, Add, Edit	View, Add, Edit	View	View, Add, Edit	View	View	–	–
FAD [Region] Head	View	View	View	View	View	View	View	View	View	View	View
FAD [Region] Creator	View	View	View	View	View	View	View	View	View	View, Add, Edit	View, Add, Edit

in PT XYZ, so that both systems can be integrated. To connect the two systems can be done through the menu Content Server Administration> Extended ECM> Configure Connections to External System. Next, we create a Business object type which is a configuration item for SAP objects in OpenText Content Server. The business object type represents the SAP object to be integrated, so we create a business object type for each SAP object. Here we specify the pattern name and enter the field of attribute in the provider property. Users of PT XYZ will be entered into groups that have previously been created. Each group has different permissions for the business workspace and the folders in it. The permissions on OpenText Content Server are view, add (add), edit (edit), and delete (delete). The permissions of the mapped user into the group are described in Table 1.

Customization results do not alter the running business processes but only make it easier for users to save documents. For each process, although the process is different but the way it does to attach the document is the same. For example, on maintenance notification (see Figure 1), TSD [Region] Creator performs Maintenance Notification as usual to form a Maintenance Notification number. TSD [Region] Creator view Maintenance Notification is formed.
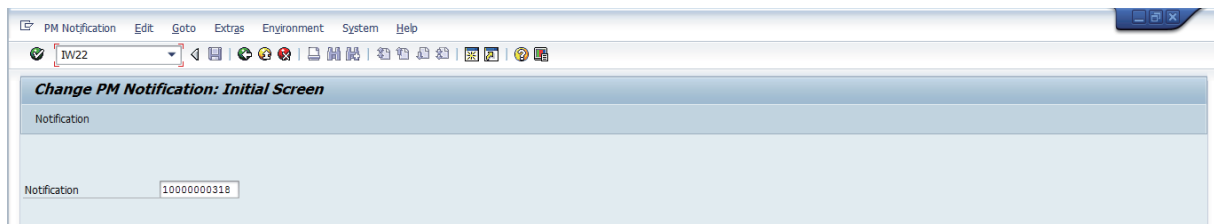

FIGURE 1. Change Maintenance Notification

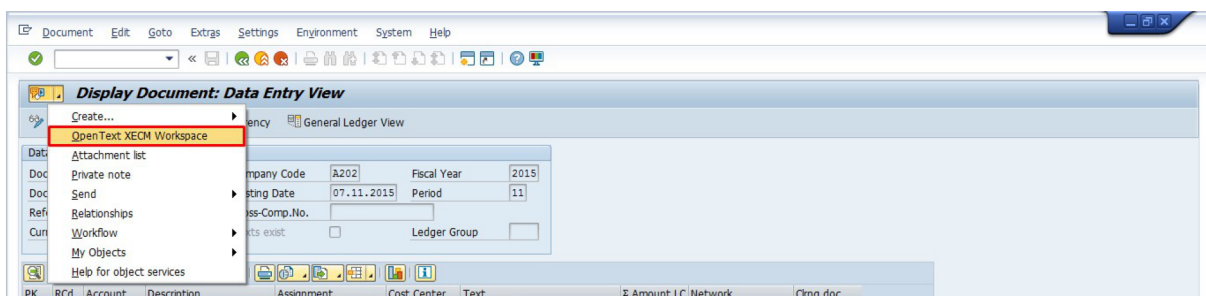To enter supporting documents, click on GOS> "OpenText XECM Workspace" (see Figure 2).

FIGURE 2. Change Maintenance Notification – GOS

SAP will display the business workspace page for the Maintenance Notification number. TSD [Region] Creator only has access to 01.TSD folder. Drag and drop the pre-made supporting documents into the bottom right box "Drop files or folders here to upload them". TSD [Region] Creator can select more than 1 document (see Figure 3).

After the upload process is successful, then the document will go into the folder "TSD" and TSD [Region] Creator that has access to related transactions can access the documents according to existing permissions.

3.3. **Comparison of steps.** The following table illustrates the comparison of steps taken for uploading documents between FTP server and OpenText xECM where using Open-Text xECM steps performed to upload fewer documents (FTP server requires 7 steps, while OpenText xECM is only 4 steps).
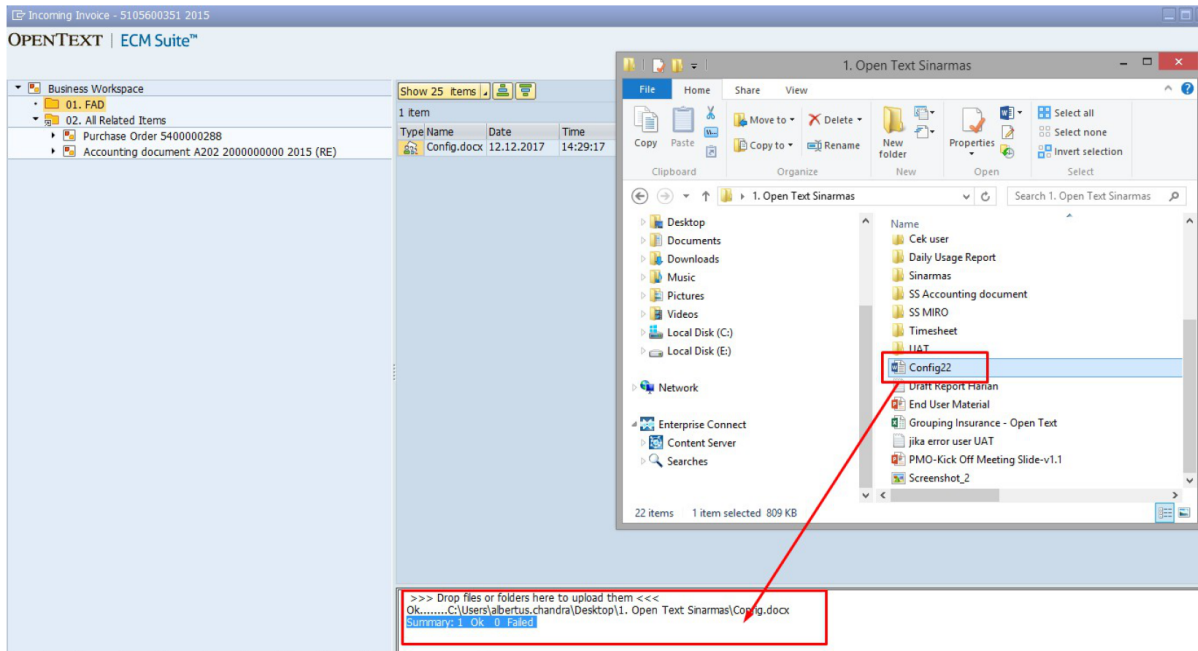
FIGURE 3. Maintenance Notification – add document

TABLE 2. Comparison between FTP and OpenText

	FTP *server*	OpenText xECM
1	Create *transaction in* SAP	Create *transaction im* SAP
2	Open the FTP *server*	Clicking OpenText XECM workspace in GOS
3	*upload* documents to FTP *server*	Choose the *folder*
4	*copy link* documents (*uploaded*)	*Drag and drop* of documents
5	Open a previously created transaction	–
6	*Create external document*	–
7	Enter the title and link in the previous generated	–

Implementation was done with 3 stages of training, system conversion, and support. Training is done informally to IT team who will manage OpenText Content Server in PT XYZ and formally to user who will use OpenText Content Server. Formal training is conducted by a consultant from ABC consulting firm at the project site. For each region, user representatives will be brought to the project site by PT XYZ. The user will be the key user and will provide training to other users after returning to their respective region. Training for key users of FAD department with course name Payment Archiving was conducted on November 2017. Training to key users of TSD and CMS department with course name Project Integration was conducted on November 2017. Training Project Integration was conducted for two days because there are 2 departments that follow the training. Go-Live was done on November, 2017. At the time of go-live user TSD, CMS and FAD can directly use OpenText Content Server on Production server. OpenText Content Server and FTP servers run in parallel. For new transactions created in OpenText Content Server while the old transaction can be viewed on the FTP server because there are still old transactions that have not been paid or reach the payment process. PT XYZ has not decided when to turn off FTP server that has been implemented or want to do data conversion. Support period is done after the go-live is 22 working days from 21 November

2017 to 20 December 2017. In support time, one consultant stand-by at client's location and with IT team from PT XYZ solve problems encountered by user after go live.

4. **Conclusions.** As for some lessons that can be drawn from writing this research is to implement OpenText integrated with SAP, and researchers need to know basic of document management, SAP business process, configuration on SAP, and ABAP. Understanding of document management and business processes in SAP is crucial because the problem at PT XYZ is the storage of documents that are not integrated with SAP and the lack of ability to manage documents. The OpenText implementation does not change the business process in SAP but only the document storage, so the author needs to generate a solution how to function OpenText function can help business processes already running in SAP. In order for the data obtained complete and consistent, make sure to conduct interviews to all parties involved in business processes, especially to users who make the project-making process. In collecting data in writing this paper, there are some requirements obtained after an interview with Head was not in accordance with the problems that exist in the field so that interviews are conducted informally with the user concerned. Steps for installation and customization can refer to the installation guide and customization guide that can be downloaded from the official OpenText portal. The installation guide explains how to install java, database, web server, and OpenText itself, while the customization guide contains steps to integrate OpenText with SAP, so stay with the existing documentation. OpenText was implemented using three server architectures because it follows the server architecture in SAP, i.e., DEV, QA, PRODUCTION (PROD). In DEV and QA OpenText components and databases can be placed on one server because only for development and user training, when it is PRODUCTION or go live, each component is placed on each server to lighten the system workload. The system conversion method used needs to be adjusted to the company's strategy. In this study, the authors use the parallel method as the basis of consideration the company does not do data conversion and want to access the old data in the old system. If the company converts data or wants to implement OpenText in the first section then its system conversion method can use direct cut-over, phased or pilot. Enterprise Content Management is a broad topic and is not limited to document management, but further research can discuss workflow and business process management which are part of Enterprise Content Management.

REFERENCES

[1] S. A. Cameron, *Enterprise Content Management: A Business and Technical Guide*, British Computer Society, Swindon, 2011.
[2] T. L. Dinh, T. A. Rickenberg, H. Fill and M. H. Breitner, Enterprise content management systems as a knowledge infrastructure, *International Journal of e-Collaboration*, vol.11, no.3, pp.49-70, 2015.
[3] J. V. Brocke and A. Simons, *Enterprise Content Management in Information Systems Research Foundations, Methods and Cases*, Springer Berlin, Berlin, 2016.
[4] Y. Shen, P. Chen and C. Wang, A study of enterprise resource planning (ERP) system performance measurement using the quantitative balanced scorecard approach, *Computers in Industry*, vol.75, pp.127-139, 2016.
[5] C. Brague, R. Champlin, F. Densborn, D. Dichmann, I. Felsheim, G. Keller and H. Stefani, *Enterprise Information Management with SAP*, Galileo Press, Boston, 2014.
[6] M. R. Gilbert, K. M. Shegda, K. Chin, G. Tay and H. Koehler-Kruener, *Magic Quadrant for Enterprise Content Management*, Gartner, Stamford, 2014.
[7] J. W. Satzinger, R. B. Jackson and S. D. Burd, *Systems Analysis and Design in a Changing World*, 6th Edition, Cengage Learning, Boston, 2012.

[8] OpenText Corporation, *OpenText Extended ECM for SAP Solutions 16.2 – Customizing Guide*, https://knowledge.opentext.com/knowledge/piroot/erlk/v160200-00/erlk-cgd/en/html/_manual.htm.

[9] R. E. Giachetti, *Design of Enterprise Systems: Theory, Architecture, and Methods*, CRC Press, Boca Raton, 2010.