

SAP MM/WMS - IMPLEMENTATION OF AN ERP SYSTEM - ANALYSIS AND RECOMMENDATIONS IN THE IT UNIT TESTING PHASE. A CASE STUDY (III).

BANȚA VIOREL-COSTIN

THE BUCHAREST UNIVERSITY OF ECONOMIC STUDIES

e-mail: viorel.banta@cig.ase.ro

Abstract

The implementation of ERP systems, in our case SAP, in the big companies that also have production as part of the company, requires adaptation to a module that can manage the storage of the products resulting from the production process. The series of articles belonging to the phase of IT tests unit (IT_BUT), has now reached Chapter III - SAP MM / WMS, in which the author will provide a series of features and recommendations regarding the implementation and adaptation of SAP in a company that has as the main object of activity – the production area. As in the other articles, the author would like to remind the fact that this phase, of testing the implemented processes / the adapted modules, is one of the most important phases of the implementation of the infoantional systems, regardless of the nature of the computer system. Throughout the implemented projects, we have seen, analyzed, solved a series of problems belonging to each module separately, so that, now more recommendations can be made, based on studies, on the implementation of information systems - in our case SAP. The MM / WMS modules are linked to each other, so that, for this article, the author will make a series of recommendations, in various situations, these will be collected during the professional activity of SAP consultant. Based on the results presented, those interested in this field can see and draw conclusions, which will subsequently help them in their professional activity. Also the results obtained can be a powerful guide in terms of future implementations in our country and beyond.

Keywords: SAP, Material Management, Warehouse Management System (WMS), Project, IT Unit Tests, Roll-out, ERP - Enterprise Resource Planning, SAP.

Classification JEL: C61, C81, M15, M41

1. Introduction and study's context

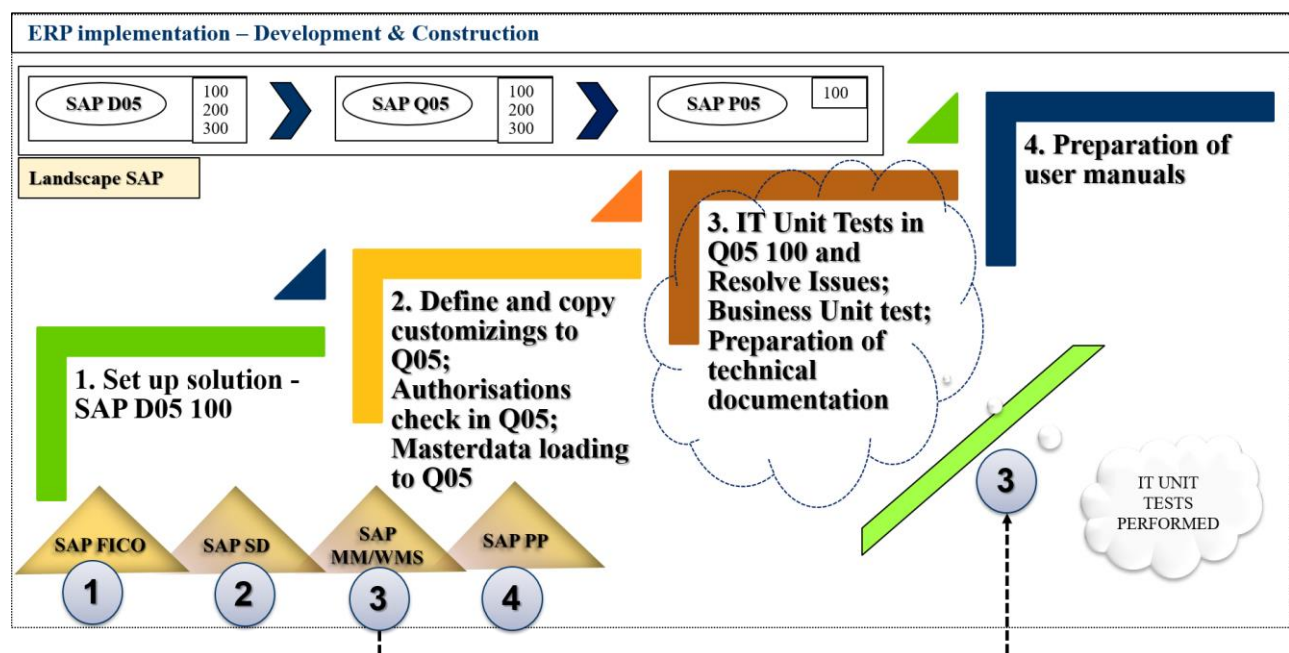
The case study materials collected during the SAP implementation projects are presented by the author in the present article, referring to a much discussed and appreciated area in the SAP world, namely the production area. Any company that has this activity, in our case a company that is located in Bucharest, also wants to implement modules to manage the materials with which it works, from purchases, processing, production and storage. SAP - over time has come with a number of changes regarding these modules, more so, lately starting to greatly optimize the processes existing in this part of the system [9]. One thing that these modules have taken into account since they were created was that of integration with the other modules existing in SAP. Thus we can talk about the integration of MM with all that means the adaptation and functioning of SAP, besides SAP FI, SAP WMS, SAP PP, SAP SD, etc [3] [4]. We can talk about SAP FI being the first layer in creating an SAP environment, as in fact SAP MM is the second in the hierarchy of adapting the modules to the business in which it will operate. It is known that the material master (which is an MM entity) [1] contains all the necessary information for the modules that interact with these types of data, such as - the PP production module - in the MM master data we have the types of MRP (Material Requirement Planning), for PM (Plant Maintenance) we have the purchasing views part, for the SAP FI module we have the accounting views part, for the SAP SD module we have the sales views part, etc. There are a number of scenarios that can be discussed, I would like to mention here that materials, managed by the MM module and managed by the WMS module, for the production module, are used in issuing the inventory and reservation, which is all part of the MM, and so on. There will be many discussions in which these implemented modules interact with each other and produce data, which subsequently, with the help of SAP FI, manages and highlights the activity of an enterprise. That's why SAP has proved to be one of the most

successful solutions, for which they have chosen a very large series, from the companies operating in this world. Throughout this implementation - for the company that produces and delivers, distributes high quality paints, a number of things have been reported, which the author discusses in this article. In the implementation of SAP MM, a number of issues were considered, such as: missing settings (external material group, material group 1, 2, 4, characteristics, dimensions ...), another high problem was the realization of two reports from a legal point of view (white spirit and packaging reports), many aspects were discussed regarding ROH packaging & weight - check solution for Romania, will be a query, should be created, etc. Regarding the WMS part [2], the author discusses an essential thing in the implementation of this module - the necessity and the adaptability, on the ground, of the way of thinking of the SAP - how this thinking can be implemented - see the space available, the capacity of the factory to produce - how the Romanian companies adapt to the way in which such a system, in our case SAP, is designed to work. If there are still some aspects related to the problems encountered in the MM module, the WMS module can be mentioned: WMS translation in ENG / RO; split warehouse Rxx between normal and DGG sections; GR in WM Rxx (1) and Rxx (2) remains in 900 storage type, for Rxx (3) will be automatically; Split Warehouse Rxx (3) between normal and DGG sections, this was requested by the management of the company.

2. Literature review conduct and results

The implementation of IT solutions has had over time various modalities of perception from the point of view of the specialized literature, modalities that had as purpose the highlighting of the different implementation processes [6]. The author has done a series of research-based searches in international databases (IEEE Xplore (IEEE), ACM Digital Library (ACM), Science Direct (SD), SpringerLink (SL) and Google scholar (GS)) where in the database. keywords used ("ERP Implementation", "Factors and risks used in ERP Implementation", "Benefits and challenges discovered in ERP Implementation", "ERP", "ERP - Enterprise Resource Planning" was searched for articles that were of interest in this scientific work. The author verified a number of approximately 32 works, out of a total of 63 works (all articles that did not have a research purpose meant to bring the benefits, risks and risks, were excluded from the verification) [5].

Figure 1 ERP - Development&Construction phase (source: compilation of the author)



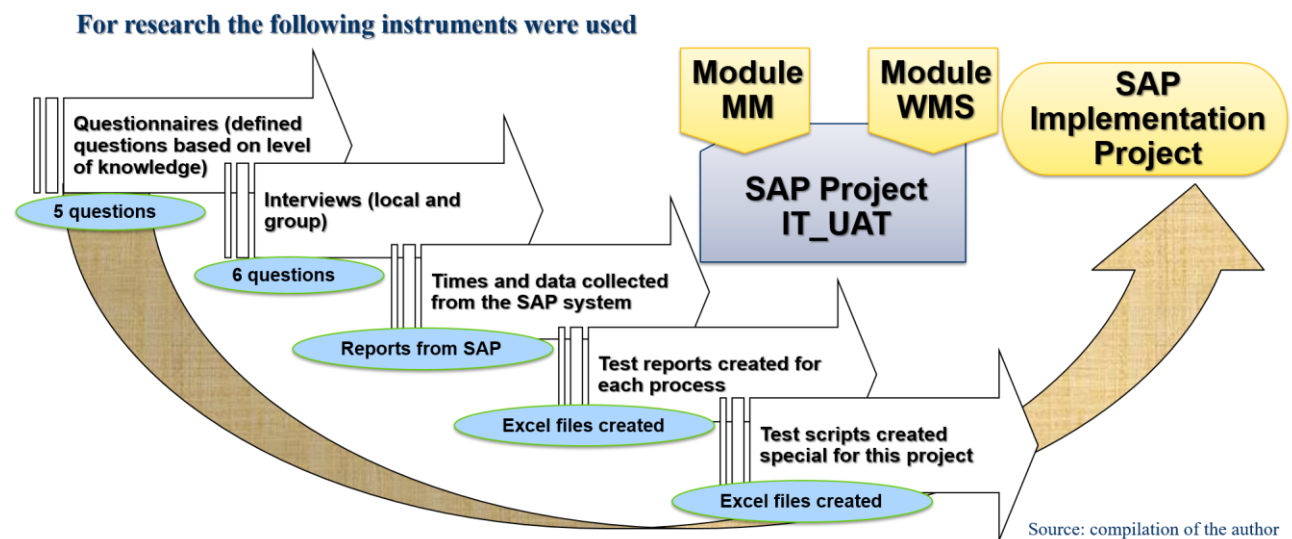
3. The research scope and motivation: methodology and key steps received in the UAT Implementation phase - SAP MM/WMS module

The reason of this article was to highlight the problems and risks faced by those who wish to adapt the two SAP modules - MM and WMS, but also to propose some regulations meant to help the two parties involved in such activities: SAP consultants on one side of the barricade, and those who invest in such systems, on the other part of the project implementation plan. Much data was collected by the author throughout the implementation. In this case, the author relied on everything that is used in the collection of information, from completed questionnaires, minutes of the meeting, to discussions with those who were involved in carrying out the project [7].

A series of data was collected, which, finally, grouped by areas of interest, are the basis of writing this article. As depicted in Figure 2, the tools used by the author in collecting information were very much based on providing some questions, with several answers, which were used by business people to show what they understood about this project, as they thought it was helpful, what influence the system will have over the years [8], how it will help them in their daily work.

The questionnaires were made available to the business environment, SAP consultants, project management, project beneficiary management. All have answered the questions asked, thus being able to highlight quantitatively the number of answers. Based on the data collected, ie the answers offered to the author, we could draw conclusions regarding the topic of this article.

Figure 2 ERP - Development&Construction phase – instruments used



4. The case study – detailed survey of research

Details regarding the context in which the case study was led

Most articles aimed to highlight the steps that have been taken in implementing ERP-type IT solutions. And here is the same thing: we have a company, a leader in its area of expertise, which is acquired by a large foreign concern, which aims, in the first year of the acquisition, to completely change its central IT system. The respective company has installed an efficient IT system, administered internally, with a series of adaptations made internally, by the existing programmers. From the beginning you can see the flexibility with which such a system can be managed. The parent company has an ERP - SAP system installed. Management decisions are predictable - one wants to move to the target system, namely SAP. Now the question arises as to

how this system should be installed: 1. Stand alone; 2. to integrate the Romanian company in their systems - rollout; 3. to install an SAP system in the cloud. The choice was one, from the point of view of the author of this article, a predictable one: SAP rollout.

Details about SAP UAT IT tests performed: problems occurred, mitigation plan, results in the SAP MM and SAP WMS areas

Integrated tests are a very important stage (here two types of tests can be defined: those of IT type ie IT_UAT and those of UAT type with business environment), both being used in the projects of implementation of the SAP integrated system. In the figure 3 are describes the steps that each SAP MM or WMS consultant must go through.

They will have to complete, for each economic process, the necessary steps in the SAP system for the process to be successfully passed. Regarding the tests performed for the MM modules - we can mention a number of difficulties encountered in SAP projects, namely: the achievement of master data - this must be done with the utmost care, knowing that all the information available here, will help, later, in almost all economic processes that use materials.

Also here we can mention that regarding the WMS module - a series of rules must be discussed very well by the functional consultants, knowing that here we are dealing with the storage of materials, finished products, we will work with scanners, with a series of notifications, which will help us later in the WMS module.

Figure 3 SAP MM/WMS-Input data excel sheet - SAP IT UAT (source: compilation of the author)

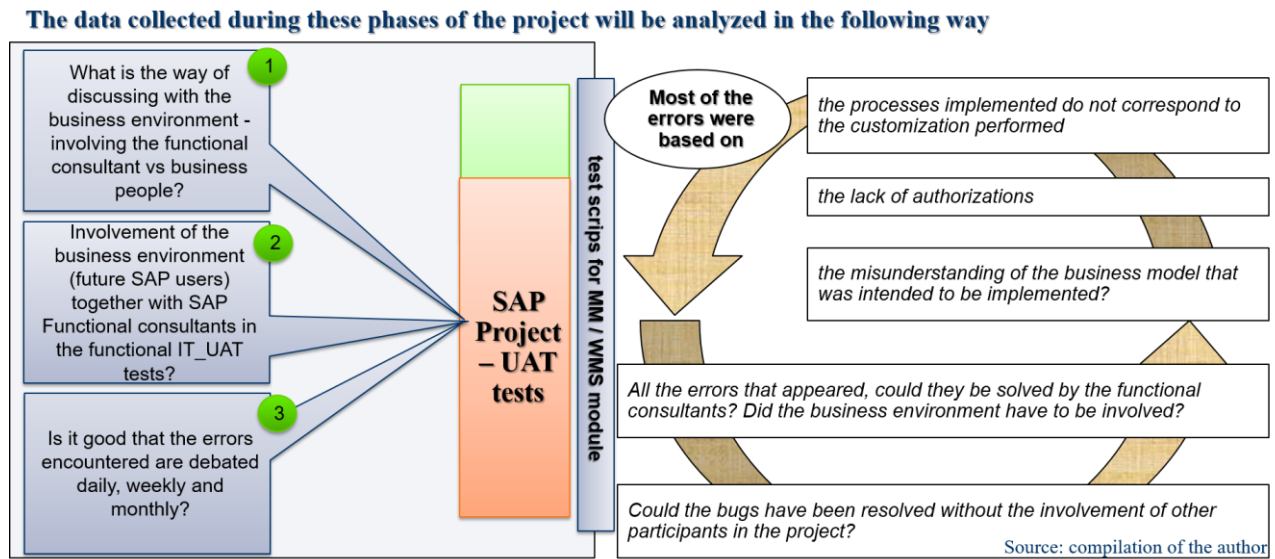
Product Test ID	MM01 / WMS	Create material master							
Team Responsible	MM								
Purpose of Test	Crate material								
Business Process									
RICEFW Included									
Dependencies									
Sign-off (Go Live) Criteria									
Script Developer	SAP Functional MM consultant								
Script Sign Off									
Execution Responsible									
Sign-off Responsible									
Start Date									
End Date									
Script Execution:									
Product Test ID	Create material master								
Step No.	Action / Description	Input Data	Test Conditions Status					Comments	Defect-ID
			Test Conditions / Prerequisites	Expected Result	Actual Result	Pass/Failed			
100	Create Customer Master								
1	Transaction: ZMAT ZMAT Material creation Sigma Group (Basic View only)	Material-case (T3M0N) Automatic EAN-number (Y/N)					Pass		
2	Transaction: MM01 Create Material (Initial Screen)	Material Industry Sector Material Type Change number Cogs from_ Material					Pass		
3	Transaction MM02 Change Material (Initial Screen)	Material Change number					Pass		
4	Transaction XK01 Create Vendor: Initial Screen	Vendor Company Code Purchasing Organization Account group					Pass		

The author collected a number of difficulties encountered during the implementation of the SAP system, in the following, we will detail 2 problems encountered on MM module:

- **Module:** MM / **Issue&Open list:** White spirit report / **Status:** FS send it to Development team, week 30, will be tested; Answer from developer: White spirit report, we have completed and it is with SAP Consultant for testing
- **Module:** MM / **Issue&Open list:** Packaging report / **Status:** "FS send it to Development team, next week (31), will be tested; *answer from developer: packaging report I am working on it should be finished by week 31, I have completed the Packaging report in D05 100. The transaction is ZMM_PACK_RO_CONS. kindly test and let me know of any concerns.*

In order to carry out these series of articles, the author has completed a series of questionnaires, in the figure 4, he has detailed some of the questions existing in those files:

Figure 4 SAP MM/WMS-Input data excel sheet - SAP IT UAT (source: compilation of the author)



All the tests performed, their number, as well as the results are detailed below in the table 1:

Table 1: The matrix of tests performed / team

	Consultants member of the team (number)	Number of tests performed NID_1	Number of tests which need Input data NID_2	Tests performed with expected results ER_1 ER < 50%	Tests performed with expected results ER_2 50%=<ER=<90%	Tests performed with expected results ER_3 ER = 100%
SAP FI	5	28	22	12 (1)	14 (2)	2 (3)
SAP MM	2	37	30	10 (1)	20 (2)	7 (3)
SAP SD	2	40	28	8 (1)	22 (2)	10 (3) + 1 MM
SAP WMS	1	19	8	2 (1)	13 (2)	4 (3)
SAP PP	2	47	36	18 (1)	22 (2)	7 (3)

Note: expected results (ER): 1. (ER < 50 %) / 2. (ER <=50 % and <= 90%); 3. (ER = 100%);

value NID_1 = ER_1 + ER_2 + ER_3;

value 20 (2) – means: 20 tests performed by 2 consultants (1 from MM team/1 from WMS) with expected errors

Based on the research done, we have a situation on the involvement of SAP MM/WMS consultants (2 seniors (MM/WMS) and 1 junior (MM)), the percentage of participation was 8% + 17%.

Figure 5 Percentage of participation in the / modules - SAP IT UAT

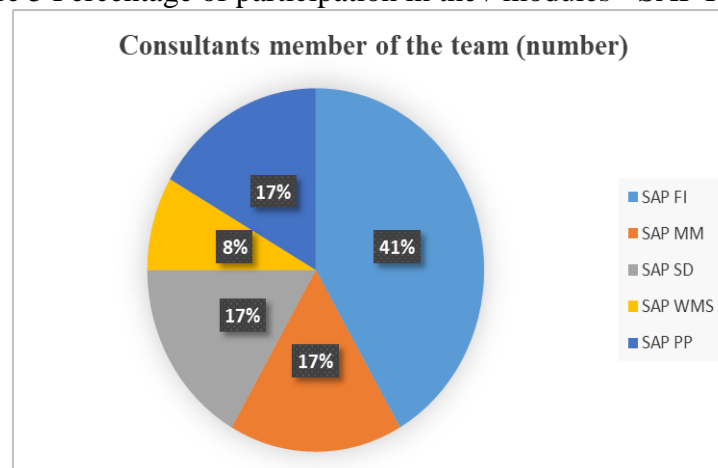
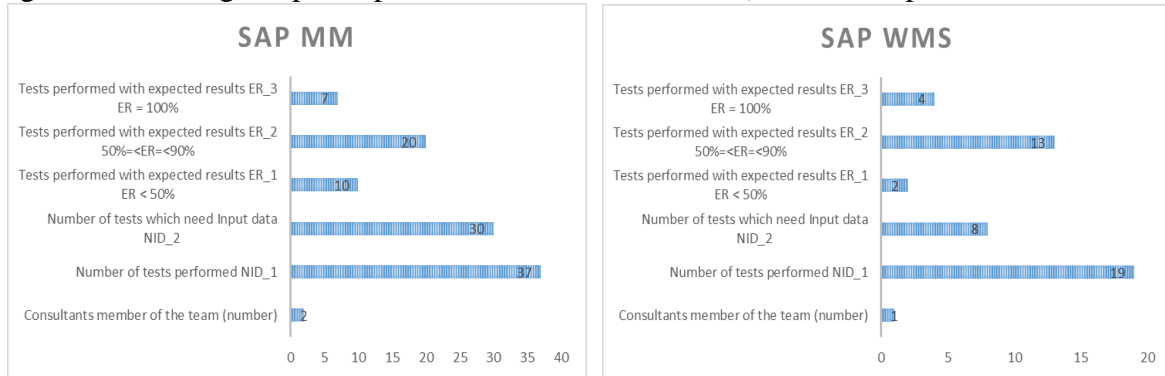


Figure 6 Percentage of participation in the - SAP IT UAT (source: compilation of the author)



5. Conclusions

The conclusions that the author draws from this experience are that for each of the two modules analyzed in this article, the involvement of more consultants would have been a real help for the whole project. Most problems arose during the phase as the master data from MM was in the customer's care, and the subsequent approach of the errors that appeared (lack of data) was very difficult. Regarding WMS, the author can conclude that the spaces offered for modeling the system were very small, which led to many elaborate scenarios, lost times, difficult understanding of the system, from the client. Regarding the WMS module, it is worth noting that the client who wanted to implement this system wanted to bring a successful model to another company, part of the group, was very insistent on its implementation, but in the end it proved to be a failure (very small storage space, the adopted model did not correspond to the working mode in Bucharest, etc.). This meant many hours of consulting, in modeling the system, and the results were not concise with what was wanted. Here it became clear that the correlation between the project, the tasks and problems encountered, was a deficient one.

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