



long term technical assistance

**EU-AFD TECHNICAL ASSISTANCE PROGRAMME TO SUPPORT
REFORMS IN THE WATER AND WASTEWATER SECTORS
IN LEBANON**



Funded by the
European Union



Implemented by AFD

**SHORT NOTE
ON THE STATUS OF THE ERP SYSTEMS
AT THE FOUR WATER ESTABLISHMENTS**

September 2022



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LIST OF ACRONYMS

AFD	Agence Française de Développement
BMLWE	Beirut and Mount Lebanon Water Establishment
BWE	Beqaa Water Establishment
CRM	Customer Relationship Management
CMMS	Computerized Maintenance Management System
CDR	Council for Development and Reconstruction
EDL	Électricité du Liban
ERP	Enterprise Resource Planning
GIMA	Geographical Information Management & Applications
GIS	Geographic Information System
LWP	Lebanon Water Program
LWPP	Lebanon Water Policy Program
LWWSS	Lebanon Water and Wastewater Sector Support
MOTGE	Mise en place des Outils et Techniques de Gestion de l'Eau
NAV	Microsoft Dynamics NAVISION
NLWE	North Lebanon Water Establishment
PIMS	Profiles Integrated Management System
SAFEGE	Société Anonyme Française d'Etudes et de Gestion d'Entreprises
SCADA	Supervisory Control and Data Acquisition
SLWE	South Lebanon Water Establishment
WE	Water Establishment
WSC	Lebanon Water, Sanitation, and Conservation

1 INTRODUCTION

The purpose of an Enterprise Resource Planning system is to facilitate the flow of information between all business functions; Microsoft Dynamics Navision software is an accounting software that goes beyond simple bookkeeping, and allows elaborate reporting that can be exported to other programs for publishing or further analysis.

Navision (NAV) was introduced in 2011 under USAID/LWWSS program to provide water establishments with an advanced system, including all necessary components such as servers, storage, backup power supplies, share point, and remote communications to allow for remote workstations at different locations to access the central servers and execute live transactions.

2 AVAILABLE MODULES

1.1 FINANCIAL MANAGEMENT

It handles all financial transactions of the water establishment, and covers G/L budgeting, financial reporting, cash management, receivables and payables, fixed assets, VAT and tax reporting, inter-department transactions, cost accounting, consolidation, ...

1.2 BILLING AND COLLECTION

This module contains current subscriber information: personal identification, location and contact details, subscription and connection particulars, standing and account statement. It generates invoices for all subscribers at the beginning of each year, allows for addition of new subscribers during the year, as well as modifications and cancelations, and miscellaneous invoices for specific jobs or other non-recurrent services.

1.3 PROCUREMENT

From request for quotation, to purchase order, and tracking reception, it includes suppliers details, order processing, approvals, costing, etc

1.4 INVENTORY

Updates stocks on hand as orders are received, or dispatched on a job. It includes all items, location, cost, reorder level, bookings on jobs, and processes shipping slips and delivery orders.

1.5 HUMAN RESOURCES

Permanent and contractual employee identification and details: Personal info, starting date, level and rank, family status, monthly timesheet (overtime-vacations-absence)..

1.6 PAYROLL

Draws information from HR, calculates employee pay slips, allocates batch transfers of due amounts to employees' respective domiciliation banks.

1.7 CRM

Customer relations management, linked to billing and collection module, it allows registering and following up on subscribers' claims and requests.

1.8 DOCUMENT REGISTER

Allows systematic registration of all incoming documents from outside and from within the establishment, for tracing the status of the correspondence, and has a feature to reference and scan documents for archiving purposes.

3 TIMELINE

3.1 NLWE

USAID, under the LWP program, implemented NAV 2016; They had been operating the X7 billing and collection- GIMA maintenance- and GIS software, coupled with PIMS accounting since 2003.

3.2 BMLWE

Implementation was initiated in 2010 under the LWWSS program, except for the Billing and collection module as they had developed, and still, are running their own in-house program.

3.3 SLWE

USAID, under the LWP program, implemented JD Edwards system since 2006. It was replaced by NAV in 2014 (LWWSS).

3.4 BWE

The system was installed in 2011 under the LWWSS program, and put online in 2013. It was upgraded to 2018 version of NAV in 2019 (LWP).

BWE operated a subscribers' database for billing and collection on Access since 2004. It had installed, customized, and migrated its data to X7 software in 2009, and was to be interfaced with PIMS accounting; It was never put online as the SAFEGE/MOTGE program was terminated.

4 COMMON PROBLEMS AFFECTING THE EFFICIENT APPLICATION OF ERP

- Each of the four establishments did not produce a cut-off balance upon the actual merger of local water authorities to the different establishments in 2005, therefore, starting accounting balances were incomplete and inaccurate.
- To varying degrees, previous permanent and daily employees, that were employed by authorities prior to 2005, did not have the required academic degrees or pertinent experience to populate the new organization chart of the establishments. Accounting employees were assigned to positions beyond their capacities, with remunerations based on their actual rank, and not in line with the responsibilities they were invested.
- Local water commissions did not adhere to the establishments as stipulated by Law 221, and continued to levy water service fees, at a time when the establishments owned the facilities by law, and were being charged for power consumption on these facilities. Therefore, accounts payable to EDL constituted liabilities on the establishments, but were not matched with revenues or accounts receivable.
- Fixed assets list is incomplete with inaccurate valuations, this is due to many reasons:
- Many old facilities, in use by locals or abandoned are not identified nor documented.
 - Confusion in ownership of public assets, Uncharted, governmental, municipal, religious, irregular use, and establishments.
 - Age and state of most equipment is unknown

Consequently, fixed assets were understated, affecting depreciation values and balance sheet.

5 OBSERVATIONS AND COMMENTS

5.1 GENERAL

As all four establishments offer identical services, have similar chart of accounts, equivalent employment procedures, payroll and benefits schemes, hold the same stock items, and are required to submit corresponding vat and income tax statements, budgets and financial reports

to relevant authorities, all should be using the same version of the software, with the same database diagram, and table links.

Except for BMLWE, the subscribers' database, and the billing and collection should have the same structure and data flow, allowing the input of yearly fees, and specifications for other services and penalty calculations as per their respective board decisions.

5.2 BWE

Implementation of NAV at BWE was reviewed in depth. It appeared that :

- Migration to 2018 version of the program made way for problems and errors that were addressed, or not present in the earlier version.
- No database diagram or table relationship diagram is available to identify the processes and links between tables. It also revealed that it has exceeded the default number of tables which points out to redundant processes requiring additional tables to execute.
- Access to transaction entries was left open to modify or correct errors in data entry, whereas transactions ought to be reversed and re-entered correctly to preserve data consistency.
- Inaccurate results mainly in payroll and in billing and collection were traced to hard coding within the program to get the required results on previous version.
- Employee information is entered and updated for rank, overtime, holidays, etc... in the human resources department, and reflected in the accounting department .It is generated monthly on the system, but still needs to be reviewed and corrected each month as a few random pay slips do not match.
- Original billing data migrated back in 2013, had been recalculated with different parameters and rates that were prevalent yearly from 1996 to 2013.
- This year billing issued in June 2022 was overstated by a sensible amount; bills paid in 4 instalments were actually issued four invoices, for the full amount in some cases, or for the instalment amount in others. This error first appeared in 2018, was addressed several times by the developer, but keeps recurring.
- Monthly billing and collection reports and collection rate produce different results for the same elapsed time period within a short interval. (problem with field filters)
- Some overdue accounts payables, mainly EDL have not been migrated to NAV, do not show in liabilities, and are only entered upon settlement.
- Coding of known and migrated fixed assets, discounted values (depreciation), new additions is incomplete (BWE staff or third party), and processing (developer) still needs to be validated.
- Comprehensive reports have not been set up for all modules, and existing reports are inconsistent.
- Financial reports, trial balance, profit and loss, or income statement, would automatically be produced by the system, but require developer intervention for corrections.

- Report generation requires the selection of pertinent fields, and applying filters to produce needed statements; Discrepancies in reports are believed to be related to table structures, relations, and data flow.
- Other issues relating to documents register and CRM reports that do not reflect the stages of the process, its outcome, and the ageing of active requests.
- There is a need to validate the allocation of chart of account entries and ensure they correspond to their respective public accounting budget items.

The issues BWE is facing are due in large part to the missing database diagram, the succession of different developers on the system that had to speculate on how tables were linked, and resorted to hardcoding when an error popped up or was discovered.

Activity	Comments
Budget	Error in closing fiscal year, discrepancies in balance forward from previous year, misallocated ledger entries
Fixed Assets	Incomplete migration, inconsistent coding allocation to cost centers
Accounting	Financial reports require developer intervention, and corrections /adjustments
Procurement	No comprehensive report, transactions not concurrent with costing, stock entries and deliveries.
Inventory	Reports are being generated successfully from the system- (incomplete)-procured items provisioned in procurement are not systematically imported upon delivery
HR and Payroll	Discrepancies in income tax calculation-Missing Ledger entries -inaccurate reports
Billing and Collection	Validated database accounts and transactions produce different results each time a report is generated. Wrong penalty calculations, duplicated invoice values on accounts with instalments.
Document Register	No errors – no comprehensive reports on completed and pending issues
CRM	No Reports – ageing- follow up- resolution
Cost centres	Not identified in chart of accounts, widely allocated to departments in SQL fields

5.3 BMLWE

After meeting with key employees in charge of the ERP at BMLWE, it appears that the program implementation still needs to be completed. They state they are satisfied with the output generated by NAV; nonetheless, they are still dependent on the intervention of an external developer in order to generate and correct module reports and periodic financial reports.

The developer who implemented the system in 2010 has continued providing support under different USAID programs. However, presently this same developer is directly contracted by BMLWE for 2 days a week to make corrections, adjustments, updates, and to validate reports generation. But his contract ended in August 2022 and is not renewed yet.

5.4 NLWE AND SLWE

In NLWE and SLWE, the same developer is addressing issues, continuing implementation, and overseeing financial reports generation, under contract with USAID/LWP.

6 FINAL ASSESSMENT AND COURSE OF ACTION

When LWP program terminated, USAID's WSC program took over financing and providing support to the systems in the four WEs.

The present report was shared, commented on, and discussed with WSC program team.

It was noted that the WEs are losing staff due to the current crisis. The dilution of their wages, and the fast exponential inflation, pushed qualified contractual employees to leave the WE.

There was a common concern as to the commitment of remaining employees to execute transactions in a timely manner and ensure transactions' data entry accuracy to bring about successful implementation, auditing, and validation.

WCS comments were direct answers to some report statements, from WSC perspective, that could be debatable, but it was determined that most comments were faulting operators, and others were linked to programming bugs that would have been resolved.

Nevertheless, WSC showed willingness to continue providing support to the system, and addressing the points raised, relative to establishing a database diagram (Flowchart) auditing processes, issuing and validating financial reports, as well as monitoring for consistency across periods.

ANNEX 1. STATUS TIMELINE

	SLWE	BMLWE	BWE	NLWE
2003	In house billing and collections	In house billing and collections	In house billing and collections	X7 - PIMS
2004				
2005				
2006	JD Edwards / LWPP	In house billing and collections	In house billing and collections	X7 - PIMS
2007				
2008				
2009				
2010				
2011				
2012	NAV 2009 - LWWSS Except for billing and collection still done in house	NAV 2009 - LWWSS	NAV 2009 - LWWSS	NAV 2009 - LWWSS
2013				
2014	NAV 2013 LWWSS	NAV 2016 - LWWSS Except for billing and collection still done in house	NAV 2016 - LWWSS	NAV 2016 - LWWSS
2015				
2016				
2017				
2018				
2019	WSC - Development	WSC - Licences Except for billing and collection	NAV 2018 - LWP	NAV 2016 - LWP
2020				
2021				
2022				

ANNEX 2. CURRENT STATUS

Current Status; Page 1 of 2

Activity	SLWE Navision Version: Microsoft Dynamics NAV 2013 R2 - Version W1 7.10				BMLWE Navision Version 2016				BWE Navision Version:2018				NLWE Navision Version: Microsoft Dynamics NAV 2016				
	Year Started	Current Status	Reports	Comments	Year Started	Current Status	Reports	Comments	Year Started	Current Status	Reports	Comments	Year Started	Current Status	Frequency	Reports	Comments
Budget	2015	Operational	<input checked="" type="checkbox"/> Budgeted <input checked="" type="checkbox"/> Booked <input checked="" type="checkbox"/> Settled <input checked="" type="checkbox"/> Forwarded		2015	operating	<input checked="" type="checkbox"/> Budgeted <input checked="" type="checkbox"/> Booked <input checked="" type="checkbox"/> Settled <input checked="" type="checkbox"/> Forwarded	80% Completion	2011	operating	<input checked="" type="checkbox"/> Budgeted <input checked="" type="checkbox"/> Booked <input checked="" type="checkbox"/> Settled <input checked="" type="checkbox"/> Forwarded	Eventual corrections on values brought forward	2019	Operational	As per user	<input checked="" type="checkbox"/> Budgeted <input checked="" type="checkbox"/> Booked <input checked="" type="checkbox"/> Settled <input checked="" type="checkbox"/> Forwarded	
Fixed Assets	2015	Operational	<input checked="" type="checkbox"/> Year acquired <input checked="" type="checkbox"/> Cost <input checked="" type="checkbox"/> Depreciation <input checked="" type="checkbox"/> Value	Assets are registered in 2018 on the ERP but not all assets were assessed and valued	2015	operating	<input checked="" type="checkbox"/> Year acquired <input checked="" type="checkbox"/> Cost <input checked="" type="checkbox"/> Depreciation <input checked="" type="checkbox"/> Value	30% Completion	2013	operating	<input checked="" type="checkbox"/> Year acquired <input checked="" type="checkbox"/> Cost <input checked="" type="checkbox"/> Depreciation <input checked="" type="checkbox"/> Value	Assets were registered in 2013 on the ERP but not all assets were assessed and valued. New donor projects not systematically input. About 70% completion - older facilities valued in 2010 by Libanconsult	2017	Operational	As per user	<input checked="" type="checkbox"/> Year acquired <input checked="" type="checkbox"/> Cost <input checked="" type="checkbox"/> Depreciation <input checked="" type="checkbox"/> Value	Incomplete
Accounting	2015	Operational	<input checked="" type="checkbox"/> Accounts Payable <input checked="" type="checkbox"/> Accounts Receivable <input checked="" type="checkbox"/> Treasury reconciliation <input checked="" type="checkbox"/> Cash flow <input checked="" type="checkbox"/> Trial Balance <input checked="" type="checkbox"/> Income Statement <input checked="" type="checkbox"/> Balance Sheet		2015	operating	<input checked="" type="checkbox"/> Accounts Payable <input checked="" type="checkbox"/> Accounts Receivable <input checked="" type="checkbox"/> Treasury reconciliation <input checked="" type="checkbox"/> Cash flow <input checked="" type="checkbox"/> Trial Balance <input checked="" type="checkbox"/> Income Statement <input checked="" type="checkbox"/> Balance Sheet	80% Completion	2013	operating	<input checked="" type="checkbox"/> Accounts Payable <input checked="" type="checkbox"/> Accounts Receivable <input checked="" type="checkbox"/> Treasury reconciliation <input checked="" type="checkbox"/> Cash flow <input checked="" type="checkbox"/> Trial Balance <input checked="" type="checkbox"/> Income Statement <input checked="" type="checkbox"/> Balance Sheet	Constantly correcting report errors Manual Manual Manual Manual	2019	Operational	As per user	<input checked="" type="checkbox"/> Accounts Payable <input checked="" type="checkbox"/> Accounts Receivable <input checked="" type="checkbox"/> Treasury reconciliation <input checked="" type="checkbox"/> Cash flow <input checked="" type="checkbox"/> Trial Balance <input checked="" type="checkbox"/> Income Statement <input checked="" type="checkbox"/> Balance Sheet	
Procurement	2015	Operational	<input checked="" type="checkbox"/> Orders by Period <input checked="" type="checkbox"/> Orders by Item <input checked="" type="checkbox"/> Orders by Supplier		2015	operating	<input checked="" type="checkbox"/> Orders by Period <input checked="" type="checkbox"/> Orders by Item <input checked="" type="checkbox"/> Orders by Supplier	80% Completion	2013	operating	<input checked="" type="checkbox"/> Orders by Period <input checked="" type="checkbox"/> Orders by Item <input checked="" type="checkbox"/> Orders by Supplier		2019	Operational	As per user	<input checked="" type="checkbox"/> Orders by Period <input checked="" type="checkbox"/> Orders by Item <input checked="" type="checkbox"/> Orders by Supplier	
Inventory	2015	Operational	<input checked="" type="checkbox"/> Items Movement/Balance <input checked="" type="checkbox"/> Items Value <input checked="" type="checkbox"/> Annual Stock take		2015	operating	<input checked="" type="checkbox"/> Items Movement/Balance <input checked="" type="checkbox"/> Items Value <input checked="" type="checkbox"/> Annual Stock take	80% Completion	2013	operating	<input checked="" type="checkbox"/> Items Movement/Balance <input checked="" type="checkbox"/> Items Value <input checked="" type="checkbox"/> Annual Stock take	Delays in data entry, not linked to procurement, Third party grants not systematically entered. Average costing inaccurate due to missing information, mainly granted items.	2019	Operational	As per user	<input checked="" type="checkbox"/> Items Movement/Balance <input checked="" type="checkbox"/> Items Value <input checked="" type="checkbox"/> Annual Stock take	
HR and Payroll	2015	Operational	<input checked="" type="checkbox"/> Employees info and status <input checked="" type="checkbox"/> Payroll <input checked="" type="checkbox"/> Benefits		2015	operating	<input checked="" type="checkbox"/> Employees info and status <input checked="" type="checkbox"/> Payroll <input checked="" type="checkbox"/> Benefits	80% Completion	2012	operating	<input checked="" type="checkbox"/> Employees info and status <input checked="" type="checkbox"/> Payroll <input checked="" type="checkbox"/> Benefits	Requires Developer intervention Mainly done on Excel - outside the system	2019	Operational	As per user	<input checked="" type="checkbox"/> Employees info and status <input checked="" type="checkbox"/> Payroll <input checked="" type="checkbox"/> Benefits	
Billing and Collection	2015	Operational	<input checked="" type="checkbox"/> Year start billing <input checked="" type="checkbox"/> New Subscriptions <input checked="" type="checkbox"/> Collections <input checked="" type="checkbox"/> Collection rate <input checked="" type="checkbox"/> Collectors performance (%)		2002	operating	<input checked="" type="checkbox"/> Year start billing <input checked="" type="checkbox"/> New Subscriptions <input checked="" type="checkbox"/> Collections <input checked="" type="checkbox"/> Collection rate <input checked="" type="checkbox"/> Collectors performance (%)	In House programming, 90% Completion	2013	operating	<input checked="" type="checkbox"/> Year start billing <input checked="" type="checkbox"/> New Subscriptions <input checked="" type="checkbox"/> Collections <input checked="" type="checkbox"/> Collection rate <input checked="" type="checkbox"/> Collectors performance (%)	Requires Developer intervention Monthly corrections Inaccurate results	2019	Operational	As per user	<input checked="" type="checkbox"/> Year start billing <input checked="" type="checkbox"/> New Subscriptions <input checked="" type="checkbox"/> Collections <input checked="" type="checkbox"/> Collection rate <input checked="" type="checkbox"/> Collectors performance (%)	

Current Status; Page 2 of 2

SLWE Navision Version: Microsoft Dynamics NAV 2013 R2 - Version W1 7.10					BMLWE Navision Version 2016				BWE Navision Version:2018				NLWE Navision Version: Microsoft Dynamics NAV 2016				
Activity	Year Started	Current Status	Reports	Comments	Year Started	Current Status	Reports	Comments	Year Started	Current Status	Reports	Comments	Year Started	Current Status	Frequency	Reports	Comments
Document Register	2015	Operational	<ul style="list-style-type: none"> ✓ Registered documents Status Correspondence of ✓ Outcome Ageing 	Status + ageing report is incomplete, it concerns mainly documents related to accounting and finance	2015	operating	<ul style="list-style-type: none"> ✓ Registered documents Status Correspondence of ✓ Outcome Ageing 	80% Completion	2011	operating	<ul style="list-style-type: none"> ✓ Registered documents Status Correspondence of ✓ Outcome Ageing 	Search only, and listing	-	-	-	<ul style="list-style-type: none"> Registered documents Status Correspondence of Outcome Ageing 	
CRM	2019	Operational	<ul style="list-style-type: none"> ✓ Registered claims ✓ Status ✓ Outcome 		2016	operating	<ul style="list-style-type: none"> ✓ Registered claims ✓ Status ✓ Outcome 	In House programming, 90% Completion	2011	operating	<ul style="list-style-type: none"> ✓ Registered claims Status Outcome 	Search only, and listing	2020	Operational	As per user	<ul style="list-style-type: none"> ✓ Registered claims Status Outcome 	
Cost centers	-	Not Applicable	Cost and revenue by cost center	Revenues are accounted for each distribution department only, the costs are accounted for the WE as a whole; Nothing is done on the level of water	2018	operating	Cost and revenue by cost center	30% Completion	-	operating	Cost and revenue by cost center	Revenues are allocated to four four service areas, Costs are not assigned to either facilities or service areas.	2019	Operational	As per user	<ul style="list-style-type: none"> ✓ Cost and revenue by cost center 	
CMMS	2021	Operational	<ul style="list-style-type: none"> ✓ Facility preventative Maintenance list Inventory availability of required parts/consumables Executed and Expected Work Orders Cost of Work orders Parts Allocated Labor 		n/a	n/a	<ul style="list-style-type: none"> Facility preventative Maintenance list Inventory availability of required parts/consumables Executed and Expected Work Orders Cost of Work orders Parts Allocated Labor 	n/a	n/a	n/a	<ul style="list-style-type: none"> Facility preventative Maintenance list Inventory availability of required parts/consumables Executed and Expected Work Orders Cost of Work orders Parts Allocated Labor 		-	-	-	<ul style="list-style-type: none"> Facility preventative Maintenance list Inventory availability of required parts/consumables Executed and Expected Work Orders Cost of Work orders Parts Allocated Labor 	
Laboratories	2019	Operational	<ul style="list-style-type: none"> ✓ Lab results, Work orders 	Water quality module is integrated with GIS for the visualization and monitoring of results on two dashboards	n/a	n/a		n/a	n/a	n/a			-	-	-		