









TUTORIAL BASIC

- 1. SESSION 1: INTRODUCTION
 - Introduction to OPTEX (Section 1)
 - OPTEX-EXCEL-MMS (Section 2)
- 2. SESSION 2: VRP MODELING IN EXCEL
 - VRP: Vehicle Routing Problem (Section 3)
 - Implementing VRP Model using EXCEL (Section 4)
- 3. SESSION 3: USING EXCEL TO LOAD DATA
 - Industrial Data Information Systems –IDIS- (Section 5)
- 4. SESSION 4: OPTEX-GUI LOADING MODELS
 - Loading the Model in OPTEX-MMIS (Section 6)
 - Verification of the Model in OPTEX-MMIS (Section 7)
- 5. SESSION 5: Loading and Checking Industrial Data
 - Implementation and Validation of IDIS- (Section 8)
- 6. SESSION 6: Solving Mathematical Models
 - Scenarios and Families of Scenarios (Section 9)
 - Solution of Mathematical Problems (Section 10)
 - Results Information System (Section 11)
- 7. SESSION 7: SQL Servers
 - Using SQL Servers for IDIS (Section 12)
- 8. SESSION 8: Optimization Technologies
 - Solving Problems using C (Section 13.1)
 - Solving Problems using GAMS (Section 13.2)
 - Solving Problems using IBM OPL (Section 13.3)







TUTORIAL IMPLEMENTATION OF THE VRP PROBLEM (VEHICLE ROUTING PROBLEM)

TUTORIAL BASIC

- 5. SESSION 5: Loading and Checking Industrial Data
 - Implementation and Validation of IDIS (Section 8)





The implementation of the IDIS requires several steps for the correct operation of OPTEX-GUI, the steps are:

- Checking of the data model of the IDIS
- Loading data to the template OPTEX_VRP.xls
- Generation of OPTEX-GUI structures
- Import the data to the IDIS to be accessed by OPTEX-GUI
- Check the integrity of the IDIS, taking into account the rules established by the modeler





Below, it is the process to review and validate the data model of the IDIS to continue once all tables that are part of the MMIS has been loaded. This process is aimed to introduce the services provided by OPTEX to facilitate implementation, correction and set up of industrial data information system. This will be followed as a guide the generated reports to access tables that contain the data model structure: CAMRE, CDBAS and DDBAS.

The first step is to proceed to create the tables that are defined in the MMIS, so must access to the table that contains Data Tables and to active with the click on the right bouton mouse of the service of creation of tables, as shown in the following image.

GENEX-VRP -	Data Tables - [Data Tables] lición Ver Análicis Ver Avuda					_	o ×	~
💫 🐴 🐴 👖				<u>2 M @ 24 </u> , 42 <u>@</u>	<u>Fi</u> == I ? So 9			
Data Table	Spanish Des	scrip	Sp	anish Descrip	English Desc	prip	Gen Window	
CAJAS DIAS ESC_CAJ ESC_DIA ESC_NOD ESC_PED ESC_VEH HORARIO NOD_NOD NODOS NOR_VEH	Maestra Cajas Maestra Días Escenarios Cajas Escenarios Días Escenarios Nodo Escenarios Pedido Escenarios Vehículos Horario de Atención Nodos <> Nodos Maestra Nodos Nodo Origen <> Vehículos	Browse Tabla Crear Tabla Eliminar Tabla (DBF o SQL) Eliminar Todas las Tablas (DBF o Generar Tablas Dependientes Procesar Tablas Importar Estructura Tabla DBF Encriptar Claves Primarias	SQL)		Image:		.F. .F.	
PED_CAJ	Pedidos <-> Cajas	Generar Documentos RTF	>				.F.	.F
PEDI VEH_ VEHI Tabla Tabla Tabla	s DBF o SQL s OPTEX-EXCEL-XML s Libro OPTEX-EXCEL-XML s CSV	Crear/Recrear/Exportar Tablas d Crear Tablas Vacias Exportar a Sistema de Informaci Chequeo Integridad Referencial Importar Tablas Crear Index SQL	el Modelo de Datos > on Geografica - Tranferencias Tablas >				.F. .F. .F.	



The result of the process is the creation of tables and reports CREAR_DB.LOG and ERROR_CREAR_DB. LOG that contains, if any, the found errors; such as the following image presents it.

OPTEX - \ERROR_CREAR_DB.LOG	_		×
		Cerrar	
Fecha de creacion del archivo: 13/12/2015 - 09:04:00 09:04:00			
Tabla: ESC_PED - Campo: COD_PED -> ERROR-> La longitud del campo es diferente a la definida para el campo relacional.			
Tabla: ESC_VEH - Campo: COD_VEH -> ERROR-> La longitud del campo es diferente a la definida para el campo relacional.			
Tabla: NOR_VEH - Campo: COD_VEH -> ERROR-> La longitud del campo es diferente a la definida para el campo relacional.			
Tabla: PED_CAJ - Campo: COD_PED -> ERROR-> La longitud del campo es diferente a la definida para el campo relacional.			
Tabla: PEDIDOS - Campo: COD_PED -> ERROR-> La longitud del campo es diferente a la definida para el campo relacional.			
Tabla: VEH_NOD - Campo: COD_VEH -> ERROR-> La longitud del campo es diferente a la definida para el campo relacional.			
Tabla: VEHICULOS - Campo: COD_VEH -> ERROR-> La longitud del campo es diferente a la definida para el campo relacional.			
Fecha de finalización del archivo: 13/12/2015 - 09:04:00			





In this case, it was found inconsistencies in the length of the relational fields (keys) defined in the table CAMRE with the existing tables fields, the errors are presented for the COD_VEH and COD_PED fields. To find the errors you can access the CAMRE table and from there locate the inconsistencies; to do this access option RELATED TABLES (Tablas Relacionadas), as shown in the following image.

OPTEX-VRP	- Relational Field Control									– 🗆 X
<u>Archivo</u> <u>E</u> dició	ón <u>V</u> er <u>A</u> nálisis Ver A <u>y</u> uda									
ès à à		x 🖻 🛍		K 🖵 🛍 💷 🔍	Q¦≘∄¦ℤ↓	9% 84	Å, Ø	<u>as</u>	⊞ ⊮	E∑ Hamman Z ? � ¶
🚰 Relational F	Field Control			- • ×	Database Fie	lds				
Code	Description	TC	Longitude	Decimal	Data Table	Field	Туре	Lon	Dec	Des_Campo:
COD_CAJ	Código Cajas	С	15	0	ESC_PED	COD_PED		13		
COD_NOD	Código Nodo	С	15	0	PED_CAJ	COD_PED	С	13	0	
COD_NOD1	Código Nodo (Alias)	С	15	0	PEDIDOS	COD_PED	С	13	0	
COD_PED	Código Pedido	С		0						
COD_VEH	Código Vehículo	С	13	0						
										09:17:36 p. m.

a, a.		Ba (î	1 🖻 🗎 4	K 🖓 🖻			2 % 🗏 🖾	Å. 🛱	<u>as</u>	🔤 🖌	EΣ Eata Σ 9
🚰 Relational	Field Control				• 💌	📴 Database Fiel	ds				
Code	Description	TC	Longitude	Decimal		Data Table	Field	Туре	Lon	Dec	D
COD_CAJ	Código Cajas	С	15	0		ESC_VEH	COD_VEH	С			
COD_NOD	Código Nodo	С	15	0		NOR_VEH	COD_VEH	С	7	0	
COD_NOD1	Código Nodo (Alias)	С	15	0		VEH_NOD	COD_VEH	С	7	0	
COD_PED	Código Pedido	С	7	0		VEHICULOS	COD_VEH	С	7	0	
COD_VEH	Código Vehículo	С	13								



As you can see, the inconsistency is generated in the CAMRE table that has reversed lengths to COD_PED and COD_VEH. The correct OPTEX-EXCEL template is presented below.

E	a B	🖆 🗅 🕀 😃] N 🛓	A - 🏠 - A	rial 🔻	₩ ОРТ	. 🖬 -	- 0	×
Arc	hivo Inicio	Insertar Diseño de Fórmula	s Datos Revis	sar Vista Desa	arrolla EQUIPO	Q Indicar	Iniciar sesiór	n 🔉 Comparti	ir
H6		: × ✓ f _x	7						*
	А	В	С	D	E	F	G	Н	
4	COD_NOD	Código Nodo	С		NODOS		С	15	
5	COD_NOD1	Código Nodo (Alias)	С		NODOS		С	15	
6	COD_VEH	Código Vehículo	С		VEHICULOS		C	7	
7	COD_PED	Código Pedido	С		PEDIDOS		С	13	
8								4.	
9								1	
	• →	CAMRE Relational Field	Contro	CDBAS Di	+ : •				Þ.
Listo)	Pi	romedio: 10 R	ecuento: 2 Su	ıma: 20 🏼 🌐			+ 100	1%





In addition, three tables included in the definition of tables that are not part of the problem should be eliminated: DIAS, ESC_DIA and HORARIOS. Below, the EXCEL template already is correct. It should be noted that although the initial location of the tables is the permanent data area (I) since this facilitates the revision of the data contained in the IDIS, later, when you go to make runs of models, it must relocate the tables in accordance with scenarios for the runs of the mathematical models.

Portapapeles 5	Tahoma 7 A^* \equiv N K 5 \sim 2^* Δ \sim Fuente r_a r_a	E = ≫ - E E = • E • E Alineación	General \$ - % ∞ 5 - % ∞ 5 - %	 E Formato condicion Dar formato como Estilos de celda * Estilos 	hal • Insertar • tabla • Keliminar • Formato • Celdas	∑ ▼ AZY ✓ ✓ Ordenary Bu filtrar ▼ select Modificar	uscar y ccionar +
C3	\bullet : \times \checkmark f_x]						
A	В	С	D	E F	G	н і	J
1 COD_DB	DESC_DB	PATH_DB TIP	O_FILE ON_SCR	DIR_FILE	CLAVE_HLP COMEN	NTARIO	
2 Code Data T	ble Description	Data Area Ty	pe Table Quick Scree	en Generation File Directory	Windows Help Topic Comme	ents	
3 CAJAS	Maestra Cajas	I M					
4 DIAS	Maestra Días	I M			TABLAS MAESTRA	s ,	
5 NODOS	Maestra Nodos	I M	TABLA	Descripción Área	CÓDIGOS CÓDIGOS	CONJUNTOS	PARÁMETROS
6 PEDIDO:	Maestra Pedidos	I M	C0105	Maasten Chine I	RELACIONAL SECUNDARIO	5	
/ VEHICULO	S Maestra Vehículos	I M	DIAS	Maestra Días I			PECHS, VOCHS
8 ESC_CA	Escenarios Cajas	I S	NODOS	Maestra Nodos I	COD_NOD	DEC, NOD, DEK	TSER.
9 ESC_DI/	Escenarios Días	1 S	PEDIDOS	Maestra Pedidos F	COD_PED COD_NOD	PEC(c)	
10 ESC_NO	Escenarios Nodo	1 S	VEHICULO	5 Maestra Vehiculos I	COD_VEH	VEH CA	PP _w CAPV _w COVA _v , CU
11 ESC_PE	Escenarios Pedido	1 S					
12 ESC_YE	Escenarios Vehiculos	I S					
13 HORARI	Horario de Atención	I S					
14 NOD_NO	Nodos -> Nodos	I S		1	TABLAS SECUNDARI	IAS	
10 NUR_VE	Nodo Urigen <-> Veniculos	- s	TABLA	DESCRIPCIÓN	ÁREA SECUNDARIOS	CONJUNTOS	PARAMETR
10 PED_CA	Pedidos <-> Cajas	1 5	ESC CAJ	Escenarios Cajas	F COD CAJ		
10 TEH_NU	Veniculos <-> Nodos		ESC_DIA	Escenarios Días	F COD_DIA		
10			ESC_NOD	Escenarios Nodo	F COD_NOD,		
20			ESC PED	Escenarios Pedido	F COD PED		
21			ESC_VEH	Escenarios Vehículos	F COD_VEH		
22			HORARIO	Horario de Atención	I COD_NOD, COD_DIA	DIQ(c)	
23			NOD NOD	Nodos <-> Nodos	I COD NOD.	NOK(c), NOC(k)	DISTek
24					CCD_NCD1		010 104
25			NOR_VEH	Nodo Origen <-> Vehículos	I COD_NOD, COD_VEH	NOV(v)	
26			VEH NOD	Vebículos <-> Cajas		NCV(v), VEC(c), NKV	NUCA _{w,b}
			12100			VEK(k)	(- <i>p</i>
27							



GENERATION OF EXCEL TEMPLATES

OPTEX provides services to generate the EXCEL templates that are required to load industrial data. This service can be performed from the table of data tables, accessing the CREATE TABLE BOOK EXCEL XML option which will be the base to load data from the IDIS with the right click of the mouse.

GENEX-VRP - D	Data Tables Ver Análisis Ver Avuda										-	o ×
a a			D 🗶 🖵 💼	Ⅲ Q Q	≡≜	AL 🖪 % 🔳		🛛 🔜 📊 🗵	H	Z ? S 9		
Data Tables							Database Fiel	lds				
Data Table	Spanish Descrip	Gen Window	Tranfer DM	Data Model	lc	on Type	Data Table	Field		Spanish Long De		Englis
CAJAS	Maestra Cajas	.F.	.F.	.F.		M	PED_CAJ	COD_CAJ				
ESC_CAJ	Escenarios Cajas	.F.	.F.	.F.		S	PED_CAJ	COD_PED				
ESC_NOD	Escenarios Nodo	.F.	.F.	.F.		S	PED_CAJ	NUCA				
ESC_PED	Escenarios Pedido	.F.	.F.	.F.		S						
ESC_VEH	Escenarios Vehículos	.F.	.F.	.F.		S						
NOD_NOD	Nodos <-> Nodos	.F.	.F.	.F.		S						
NODOS	Maestra Nodos	.F.	.F.	.F.		М						
NOR_VEH	Nodo Origen <-> Vehículos	.F.	.F.	.F.		S						
PED_CAJ	Pedidos <-> Cajas					s						
PEDIDOS	Maestra Pedidos	.F.	.F.	.F.		Browse Tabla						
VEH_NOD	Vehículos <-> Nodos	.F.	.F.	.F.		Crear Tabla			>			
VEHICULOS	Maestra Vehículos	.F.	.F.	.F.		Eliminar Tabla	(DBF o SQL)					
						Eliminar Toda	s las Tablas (DBF o S	QL)				
						Generar Tabla	s Dependientes					
						Procesar Tabla	15					
						Importar Estru	ictura Tabla DBF					
						Encriptar Clav	es Primarias					
						Generar Docu	mentos RTF		>			
						Crear/Recrear	/Exportar Tablas del	Modelo de Datos	>			
		Tabla	s OPTEX-EXCEL	-XML		Crear Tablas V	acias		>			
		Tabla	as Libro OPTEX-I	EXCEL-XML		Exportar a Sist	ema de Informacion	Geografica				
						Chequeo Inte	gridad Referencial - '	Tranferencias Tab	las ≻			
						Importar Tabl	as		>			
<				Crear Index SO	2L					>		
					_					1		
											09:3	7:05 p. m.
	📄 🔣 🏧 🎰 🌍	w XI	0 2 P 3	ê 💈 🤅	×	Bos	or 🖇 🖷 🌔	4 💿 👯	0 🖬 🄇	🔒 🥃 🥥 🌈 🕼 🥘 📃	🚦 🗮 ESP	9:37 p. m.





GENERATION OF EXCEL TEMPLATES

The template generated by OPTEX is stored in the permanent industrial data area of IDIS, the name given to the template is OPTEX_aaa, where aaa is the name given to the application. The template can be downloaded from the URLs:

- http://www.doanalytics.net/Documents/OPTEX_VRP.xls
- http://www.doanalytics.net/Documents/OPTEX_VRP.xml

The template is generated in XML format and so that it is accepted by EXCEL should be considered when you try to open it EXCEL submit the following message, to which you must respond Yes. If the extension of the book is changed to .xml prevents this message.

Microsoft	t Excel	×
	El formato y la extensión de archivo de 'OPTEX_VRP.xIs' no coinciden. Puede que el archivo esté dañado o no sea seguro. No lo abra a menos que confíe en su origen. ¿Desea abrirlo de todos modos?	2
	<u>S</u> í <u>N</u> o Ay <u>u</u> da	

Then EXCEL will present the following window, the user must select setting of the book (Configuración del libro) and then Accept.







GENERATION OF EXCEL TEMPLATES

Finally, the user will enter the book with all the tables in the information system to load data from the IDIS. It is recommended to the user to change format to conventional EXCEL and then use OPTEX macros to export to CSV. The template includes second-row description of fields and their units, this information is taken from CDBAS and DDBAS tables from template in EXCEL.

	<u> </u>	$\checkmark f_x$														
Α	В	С	D	E	F	G	н	I.	J	J	К	L	М	N	0	Ρ
D_CAJ digo Cajas	DES_CAJ Descripcion Caja	PECA Peso de la Caja (kg)	VOCA Volumen de Caja (m3)													
						Activar		7	×							
						Activar:	Cajas									
						ESC_CAJ Escen	arios Cajas									
					-	ESC_PED Escer	narios Pedido									
						NOD_NOD No	dos <-> Nodos	S								
						NODOS Maest NOR_VEH Noc	tra Nodos lo Origen <-> \	/ehic								
						PED_CAJ Pedic PEDIDOS Mae	los <-> Cajas stra Pedidos									
						VEH_NOD Veh	iculos <-> Nod	os								
								-	-							
						-										
									~							
						_	Acepta	ar Cance	lar							
						L										
																Ē



GENERATING OPTEX-GUI STRUCTURES

This process enables the generation of a GUI interface that enables the modeler and the functional user to navigate and to explore industrial data information system (IDIS). This allows to a mathematical modeler, non-expert in SQL statements, generate a user interface, fast, with basic support for maintenance and queries of the IDIS. To carry out the process you must access the service GENERATION STRUCTURES OPTEX-GUI with the right click of the mouse in the menus of OPTEX-GUI Explorer window.





GENERATING OPTEX-GUI STRUCTURES

Through this process, OPTEX load the necessary information to set up a first version of the GUI (Graphic User Interface) which is based on:

- Exploration of the area of IDIS menus
- Generation of keys of ordering (indexes) to relate/link the tables of the IDIS
- Configuration of the container window (shell windows) to facilitate access to tables
- Configuration data window to control the information presented in each data window.

In this way, OPTEX eliminates all the programming work that involves developing an interface for the functional user; however, if the modeler wishes to create windows and/or menus specialized to functional user, this is already possible because OPTEX has other alternatives for this purpose.





Loading data from the IDIS involves three steps:

- Loading data to the template OPTEX_VRP.xls
- Import the data to the IDIS to be accessed by OPTEX-GUI
- Check the integrity of the IDIS, taking into account the rules established by the Modeler

The last two steps will be presented, the first part of the work and the creativity of the user. The template loaded for this tutorial is linked to the URL: <u>http://www.doanalytics.net/Documents/OPTEX_Plantilla_Data_VRP_1.xlsx</u>

		R	🖆 [נ	<u>p</u> e] N	A • 🖄 •	Arial 🔻 8	• <u> </u>		7 🔶	🌲 🕨	OPTEX	m –		×
Ar	chivo	Inicio	Insert	ar	Diseño de p	oágina Fói	mulas Dat	os Revisar	Vista	Desarrollador	EQUIPO	Q Indicar		Iniciar sesión	႙ Compar	tir
A	1	Ŧ	: ×		f _x	COD_VEH										*
		A	В		С	D	E	F	G	н	1 I	J	K	L	M	
1	COD_V	ΈH	DES_VEH	C	CAPP	CAPV	CUVE	COVA								
2	Codigo	Vehiculo	Descripcion	del (Capacidad del Y	Capacidad Vo	u Costo de Utiliza	ar Costo Variable (\$	S-km)							
3	SWK05	3	NHR		6000	10.5	1 125921.0	6 268.612								
4	SWK05	4	NHR		6000	10.5	1 118875.03	3 268.612								
5	SWK05	5	NHR		6000	10.5	1 114172.2	8 268.612								
6	SWK05	6	NHR		6000	10.5	1 114172.2	8 268.612								
7	SWK05	7	NKR III		8400	15.3	4 121070.4	4 357.36								
8	SWK05	8	NKR III		8400	15.3	4 125980.4	5 357.36								_
9	SWK05	9	NKR III		8400	15.3	4 130385.30	6 357.36								_
10	SWK06	0	NPR		9999	5	0 127652.8	9 415.189								
11	SWK06	1	NPR		9999	50.2	3 125906.0	6 415.189								
12	SWK06	2	NPR		9999	20.2	3 131012.1	7 415.189								_
13	SWK92	5	NHR		6000	10.5	1 115870.9	5 268.612								_
14	SWK92	16 7	NKRI		9999	14.6	1 1245/5.9	8 357.36								
15	SWK92	27	NHR		6000	10.5	1 119165.2	7 268.612								_
10	SWK92	.8	CARRY		2400	3.2	5 107005.4	9 239.4								
	4 →		VEH_NC	DIV	/ehiculos {-}	nodos V	EHICULOS	Aaestra Vehicu	los	÷ :	4					▶
List	:0]													+ 10	0%





From the EXCEL template should be to create the CSV file that will read OPTEX to load the database from the IDIS.

📙 📝 📙 🖫 ד 🖶 🔠 🗙 ד ∓ INPUT_DATA	i i i i i i i i i i i i i i i i i i i			_	
Archivo Inicio Compartir Vista					~ 🕐
Anclar al Acceso rápido	eso to Copiar a • Eliminar •	ore Nueva carpeta	Propiedades	Seleccionar t	odo ar ninguno ción
Portapapeles	Organizar	Nuevo	Abrir	Seleccio	nar
\leftarrow \rightarrow \checkmark \uparrow \square \Rightarrow Dropbox \Rightarrow GENEX \Rightarrow V	RP > VRPWO > INPUT_DATA			νÖ	uscar en 🔎
👫 DW Europa 🔷 🗌 Nom	bre	Fecha de modifica	. Tipo	Tamaño	
🌄 DW Finanzas 🛛 🐼 🖸	AJAS.csv	14/12/2015 8:44 a	Archivo de valores.	4 KB	
DW Manuales	C_CAJ.csv	14/12/2015 8:44 a	Archivo de valores.	2 KB	
DW Ofertas NEW	C_NOD.csv	14/12/2015 8:44 a	Archivo de valores.	1 KB	
DW Profesionales	C_PED.csv	14/12/2015 8:44 a	Archivo de valores.	1 KB	
DW Proyectos NEW	SC_VEH.csv	14/12/2015 8:44 a	Archivo de valores.	1 KB	
DW Referencias Oficiales	OD_NOD.csv	14/12/2015 8:44 a	Archivo de valores.	14 KB	
DW SAS	ODOS.csv	14/12/2015 8:44 a	Archivo de valores.	2 KB	
DW SOLVERS, Manuals	OR_VEH.csv	14/12/2015 8:44 a	Archivo de valores.	1 KB	
	ED_CAJ.csv	14/12/2015 8:44 a	Archivo de valores.	1 KB	
	EDIDOS.csv	14/12/2015 8:44 a	Archivo de valores.	1 KB	
Entrega Raul COES-SINAC	H_NOD.csv	14/12/2015 8:44 a	Archivo de valores.	14 KB	
EXPORT Services V	HICULUS.csv	14/12/2015 8:44 a	. Archivo de valores.	2 KB	
GENEX 🗸					
12 elementos 12 elementos seleccionados 36.9	KB				





To perform massive importation, you must access to Import Tables IDIS (Importar Tablas SIDI) service.

M OPTEX-VRP - Menu Programador OPTEX - [OPTEX_GUI - N	/enu Explorer]						– 0 ×
	🕨 🧾 🔌 🐜 🔺 🗵 ftæl 🖓 🖈	1 H I ? 👁	P				
Mathematical Definitions							
Advanced Concepts		(102)					
() Family of Scenarios		<u> </u>					
	Mathematical Definitions Advanced Concepts	Family of Scenarios	Data Model	Optimization	Auxiliar Entities	Report Configuration	
Optimization Libranes/Program				ubrailes/Program			
				Optimizar			
				Importar Tablas Sisten	na Información Indust	rial (SIDI)	
				Generar Tablas Depen	dientes SIDI		
				Chequear Integridad S	IDI		
				Exportar Sistema Infor	macion Industrial (SID	l a EXCEL)	
				Explorar Area de Datos	5		
				Exportar Tablas SQL a	DBF		
				Explorar Tablas			F3
				Importar Sistema Info	rmación Modelos Mat	emáticos (SIMM)	
				Generar Documento F	ormulación (RTF)		
				Chequeo Estructura Si	stema Soporte de Dec	isiones (SSD)	
				Exportar Sistema Infor	mación Modelos Mat	emáticos (SIMM a EXCEL)	
				Explorar Área Modelos	s Matemáticos		
				Generar Documento N	/lodelo de Datos (RTF)		
				Explorar Modelo Datos	s - Interfaz GUI		
				Generación Estructura	s OPTEX-GUI		
				Explorar Series Historio	cas		
				Explorar Anomalias			
μ							

🛛 💿 💀 🔯 🔯 😰 🛱 🧕 🤔 📕 🔼 🌒 🔯 🔅 🗮 Q 💿 🚱 😨 😒 🚳 😓 🧕 🖉 🖉 🖉

오 🗇 🍃

😽 Pas Pas

Analytics

10:56 a.m.



As a result of the process, OPTEX will generate the report INPUT_CHECK_DATA. LOG.

III OP	TEX - d:\Dropbox\genex\vrp\vrpwo\INPUT_CHECK_DATA.LOG	_		×
			Cerra	ar
10:58:06	Directorio Archivos Input: D:\DROPBOX\GENEX\VRP\VRPWO\INPUT_DATA\			^
10:58:06 10:58:06	Extension Archivos: .csv Separador Campos: ,			
10:58:06	Directorios Destino Output: Informacion Permanente: d:\Dropbox\genex\vrp\vrpda Informacion Familia: \ Informacion Escenario: \\			
10:58:06 10:58:07	Begin Process: d:\Dropbox\genex\vrp\vrpda\CAJAS.DBF End Process: CAJAS - Carga Correcta			
10:58:07 10:58:07	Begin Process: d:\Dropbox\genex\vrp\vrpda\ESC_CAJ.DBF End Process: ESC_CAJ - Carga Correcta			
10:58:07 10:58:07	Begin Process: d:\Dropbox\genex\vrp\vrpda\ESC_NOD.DBF End Process: ESC_NOD - Carga Correcta			
10:58:07 10:58:08	Begin Process: d:\Dropbox\genex\vrp\vrpda\ESC_PED.DBF End Process: ESC_PED - Carga Correcta			
10:58:08 10:58:08	Begin Process: d:\Dropbox\genex\vrp\vrpda\ESC_VEH.DBF End Process: ESC_VEH - Carga Correcta			
10:58:12	ERROR 1845-> Procesando: d:\Dropbox\genex\vrp\vrpda\NODOS - NO se pudo abrir Tabla.			
10:58:12 10:58:12	Begin Process: d:\Dropbox\genex\vrp\vrpda\NOD_NOD.DBF End Process: NOD_NOD - Carga Correcta			
10:58:12 10:58:13	Begin Process: d:\Dropbox\genex\vrp\vrpda\NOR_VEH.DBF End Process: NOR_VEH - Carga Correcta			
10:58:13 10:58:13	Begin Process: d:\Dropbox\genex\vrp\vrpda\PEDIDOS.DBF End Process: PEDIDOS - Carga Correcta			
10:58:13 10:58:13	Begin Process: d:\Dropbox\genex\vrp\vrpda\PED_CAJ.DBF End Process: PED_CAJ - Carga Correcta			~





1. TABLE: NODOS

The problem lies in the fact that the key associated with the index **k** is linked to the **COD_NOD1** field which should be part of the master node table, and it is not. As the relational key **COD_NOD1** is declared in the table **CAMRE**. Solution include **COD NOD1** in the table.

Additionally, the table node has largest number of fields to be defined: **COTA**, **COTE**, **TSER**, **COOR_X**, and COOR_Y. In this case **OPTEX** reports error reported. Solution include the fields in the table definition or delete the data in the table, the latter was implemented.

TABLA: VEH_NOD

manage the index k.

The OPTEX report indicates that the

COD NOD1 field is not included in

the table **VEH_NOD**. Solution include such a field that is required to

2.

H	R	🖻 N	F. 101	N A - S	Tahoma	- 8 -	A		bb.	OPTEX Plan	53	- 0	×
Archi	vo Inici	o Insertar	Diseño de pág	ina Fórmulas	Datos Revis	ar Vista	Desarr	ollador	EQUIPO	♀ Indicar	Iniciar sesió	n <u>A</u> Con	partir
A16	-	: ×	√ <i>f</i> ∗ N0	DOS									٣
- 41	А	В	С) E	F	G	H	1	J	К	L	
1 C	NODOS	COD_CAME *	DESC_CAMPO Código Nodo	▼ DESCOR Código	T_01 ▼ TIPO ▼ C	LONGITU - I 15	DECIMAL V	COD_UN → \	/ALIDAC(_T D	VALIDO_1 V	VALIDO_2 💌	SEQ_GET	
16	NODOS	COD_NOD1	Código Nodo Alias	Código A	lias C	15	0		D			2	
17 35 36 37	NODOS	DES_NOD	Descripción del Noc	o Descripc	ion C	30	0		D			3	-
38													-
	·	DDBAS Da	atabase Fields	DSS Decision S	upport Systems	DS!		•					Þ
Listo	Se encontr	aron 3 de 33 re	gistros 🔝		Promedio: 5.6	66666667	Recuento: 9	Suma: 1	7 🏢	= =		+	100%

E	3	R	🖆 🗋	<u>C</u>	0-		<u> </u>	🖄 🝷 Arial	* 8	· •	A 🗗	T	*	•		OPTEX	53				
Arc	hivo		Insertar	Diseño	de página		Fórmulas	Datos	Revisar	Vista	Desarrollado		EQUIPO	♀ India				esión	₽ Com	partir	
E1		Ŧ	1 × -	f_X	1																v
		A	в		с		D	E	F		G		Н				J	к		Ľ	
1	COD_I	IOD	COD_NOD1	DES_	NOD	TIPO															
2	Codigo	Nodo	Codigo Nodo(Alias)	Desc	ripcion del	Tipo d	e Nodo	Costo Penalizac	Costo Penaliz	acion Tie	empo de Servicio	Coo	ordinada X (g C	oordinada \	r (gd)						
3	83002	51421-0	8300251421-0	DIEX	S.A	ORI		100		105	c	I	74.1642192		4.69460	797					
4	83002	5638-1	830025638-1	CARF	REFOUR 20	DES		100		105	1.73	1	-74.10088		4.56	879					
5	83002	5638-4	830025638-4	CAR	REFOUR CA	DES		100		105	1.38	1	-74.06571		4.75	551					
6	83002	5638-5	830025638-5	CAR	REFOUR CH	DES		100		105	1.48	1	-74.06668		4.60	251					
7	83002	5638-7	830025638-7	CARF	REFOUR CL	DES		100		105	3.07		-74.083947		4.691	055					
8	83002	5638-17	830025638-17	CARF	REFOUR PA	DES		100		105	1.9		-74.090136		4,619	205					
9	83002	5638-18	830025638-18	CAR	REFOUR PE	DES		100		105	1.91		-74.16713		4.6	029					
10	83002	5638-22	830025638-22	CARF	REFOUR SA	DES		100		105	1.23		-74.0382		4.69	066					$\overline{\mathbf{x}}$
	• •		ESC_VEH Esc	enarios	Vehiculo	s	NOD_N	IOD Nodos	-} Nodos	NOD	0 🕀		۹.							•	
List	D													E	I (1 🗉		-1	+	100%	



Archi	vo	Inicio	lnsertar	Diseño de pá	jina Fó	rmulas Dat	os Re	visar Vist	a Desa	rrollador	EQUIPO	♀ Indicar	Iniciar sesi	ón 🎗 Com	parti
A29		Ŧ	: ×	<i>√ f</i> x V	EH_NOD										
4	1	A .	В	C		D	E	F	G	Н	1	J	K	L	
1 C	DD_DE	-	COD_CAME	DESC_CAMPO		DESCORT_01	▼ TIPO	V LONGITI V	DECIMAL *	COD_UN *	VALIDACI -	VALIDO_1 -	VALIDO_2 *	SEQ_GET	-
27	VEH	NOD	COD_VEH	Código Vehículo		Código Vehículo	C	7	0		A	VEHICULOS	COD_VEH	1	
28	VEH	NOD	COD_NOD	Código Nodo		Codigo Nodo	С	15	0		A	NODOS	COD_NOD	2	
29	VEH_	NOD	COD_NOD1	Código Nodo Alias		Codigo Nodo	С	15	0		A	NODOS	COD_NOD	3	
86 87															12
/8 }9															
	•		DDBAS D	atabase Fields	DSS D	ecision Suppo	rt System	s DS: .	🕂 🗄	4					Ð
isto		Se en	contraron 3 de	34 registros			Promedio:	6	Recuento:	11 Suma:	18 🌐	E P	_	+	100

In the previous report, it is important to note that for the tables NODOS and VEH_NOD have errors, which will be reflected in reported errors in the validation of the data. Therefore, the appropriate it is to correct these errors before proceeding to the checking of the quality of the IDIS. Below, it is the problem and the solution

Below, errors and its solution are analyzed.

As a result of the process, OPTEX will generate the report INPUT_CHECK_DATA. LOG.





The new templates should be to reimport the data and the models; alternatively, the errors can be corrected directly at OPTEX-GUI.

The new templates are located at the URLs:

- <u>http://www.doanalytics.net/Documents/OPTEX_Plantilla_Data_VRP_2.xlsx</u>
- http://www.doanalytics.net/Documents/OPTEX_Plantilla_Modelo_VRP_5.xlsx





CHECKING THE QUALITY OF DATA OF THE IDIS

The validation of the data that you enter in the mathematical models is a fundamental step which helps raise the level of reliability/quality of the data, thus avoiding possible errors in the execution of the mathematical models. You should distinguish two types of errors:

- Integrity: related to the relations between the different entities/objects that are part of database and mathematical models, stablishing via relational keys/codes/fields of different tables; and
- Veracity: related to the contents of the fields that are part of tables.

OPTEX provides services to validate the previous types of error. However, it is impossible to have an automated process to ensure one hundred percent (100%) the non-existence of errors in accuracy. A simple example of a data error can be the capability in volume in a vehicle that is 10 tons and the user enters the system 9; If the entered data meets the range of validity, it is impossible to detect the previous error of veracity.

Do not detect errors in the data translates into longer time implementation of models, since errors can lead to problems in the solution of mathematical models that may be associated with different causes, for example problems of feasibility, or leak in the mathematical models (uncontrolled productions), which can be difficult/impossible for manual verification processes to detect. This problem is increased in that mathematical models are related to problems of large dimensions.

OPTEX has validation in three points of the process, in:

- Loading data to the tables;
- The composition of sets; and
- The values of the parameters.

The first control is carried out at the time of loading data in the database, the last two during the execution of the models.





CHECKING THE QUALITY OF DATA OF THE IDIS RULES OF VALIDATION IN THE DATA MODEL

To configure data validation processes must access the table of settings of the fields from the tables of data (DDBAS), which is done accessing the container windows Data Tables and Fields of Data Bases, OPTEX-GUI, in the OPTEX-EXCEL template on the DDBAS sheet.







CHECKING THE QUALITY OF DATA OF THE IDIS RULES OF VALIDATION IN THE DATA MODEL

The fields of a data table attributes include the Type of Validation (VALIDATION or TV), which is used to guarantee the integrity of the data. The different types of validation parameters are assigned to the auxiliary fields Parameter 1 (VALIDO_1) and Parameter 2 (VALIDO_2).

E	5 F2	🖆 🗋	C 🕛 N	🗛 - 🖄 - Ta	homa	• 8 •	<u>A</u> [••	OPTEX_Plan	. 🗹	- 0	\times
Arc	hivo Inicio	Insertar	Diseño de página Fó	rmulas Datos	Revis	ar Vist	a Desai	rrollador	EOUIPO	♀ Indicar	Iniciar sesi	ón Q. Com	partir
			o iseno de pagina - roi							=		7+	p.a.c.
	-												
J1	5 ×	· ×	√ Jx										~
	٨	P	C	D	E	F	G	і <u>н</u> і				1	
1			DESC CAMPO	DESCORT 01 =			DECIMAL					SEO OFT	
2	Code Data Table	Field Code	Long Description	Short Description	Field Type	Longitude	Decimal	Unit Code	(vne Validati	Parameter # 1	Parameter # 2	Browse Segu	ence
3	CAIAS	COD CA1	Código Cajas	Código	С	15	0	one code	D	Farameter # 1	Farameter #	1	Chico
4	CAJAS	DES CAJ	Descripción Caja	Descripcion	c	10	0		D			2	
7	ESC CAJ	COD CAJ	Código Cajas	Codigo Caia	C	15	0		A	CAJAS	COD CAJ	1	
8	ESC NOD	COD NOD	Código Nodo	Codigo Nodo	С	15	0		А	NODOS	COD NOD	1	
9	ESC_NOD	COD_NOD1	Código Nodo (Alias)	Codigo Nodo	С	15	0		А	NODOS	COD_NOD	2	
10	ESC_PED	COD_PED	Código Pedido	Código Pedido	С	13	0		Α	PEDIDOS	COD_PED	1	
11	ESC_VEH	COD_VEH	Código Vehículo	Código Vehículo	С	7	0		А	VEHICULOS	COD_VEH	1	
12	NOD_NOD	COD_NOD	Código Nodo	Nodo Origen	С	15	0		Α	NODOS	COD_NOD	1	
13	NOD_NOD	COD_NOD1	Código Nodo (Alias)	Nodo Destino	С	15	0		Α	NODOS	COD_NOD	2	
15	NODO5	COD_NOD	Código Nodo	Código	С	15	0		D			1	
16	NODOS	COD_NOD1	Código Nodo Alias	Código Alias	C	15	0		D			2	
17	NODOS	DES_NOD	Descripción del Nodo	Descripcion	С	30	0		D			3	
19	NOR_VEH	COD_NOD	Código Nodo Origen	Codigo Nodo	С	15	0		Α	NODOS	COD_NOD	1	
20	NOR_VEH	COD_VEH	Código Vehículo	Código Vehículo	C	7	0		Α	VEHICULOS	COD_VEH	2	
21	PED_CAJ	COD_PED	Código Pedido	Código Pedido	C	13	0		А	PEDIDOS	COD_PED	1	
22	PED_CAJ	COD_CAJ	Código Cajas	Codigo Caja	C	15	0		А	CAJAS	COD_CAJ	2	
24	PEDIDOS	COD_PED	Código Pedido	Código	C	13	0		D			1	
25	PEDIDOS	DES_PED	Descripción del Pedido	Descripcion	C	30	0		D			2	
26	PEDIDOS	COD_NOD	Código Nodo	Codigo Nodo	С	15	0		Α	NODOS	COD_NOD	3	
27	VEH_NOD	COD_VEH	Código Vehículo	Código Vehículo	C	7	0		Α	VEHICULOS	COD_VEH	1	
28	VEH_NOD	COD_NOD	Código Nodo	Codigo Nodo	C	15	0		Α	NODOS	COD_NOD	2	
29	VEH_NOD	COD_NOD1	Código Nodo Alias	Codigo Nodo	С	15	0		Α	NODOS	COD_NOD	3	
30	VEHICULOS	COD_VEH	Código Vehículo	Código	С	7	0		D			1	
31	VEHICULOS	DES_VEH	Descripción del Vehículo	Descripcion	С	30	0		D			2	
36							~			1			
	• •	DDBAS Da	Itabase Fields DSS D	ecision Support	Systems	DS:	(+) :	•					•
List	Se encontra	ron 25 de 34 re	egistros 🔠							li 💾	-	+	100%





CHECKING THE QUALITY OF DATA OF THE IDIS RULES OF VALIDATION IN THE DATA MODEL

Multiple Types of Validation are implemented in OPTEX-GUI and all of them are intended to ensure the integrity of the relationships between the entities that are part of the information system. The template uses two types of validation A and D:

- A **Referential Integrity.** Validation by the contents of a field in a table. Used in the fields of secondary tables. It is usually the way to validate the existence of the content of a relational code in the keys/codes included in the master table. It allows duplicity and empty fields.
- **D Duplication:** Validation by duplication of the contents of the field in the table.

In general terms, the above rules are necessary, but there may be other additional rules to be included to ensure the solution to a mathematical model. The Manual of the Validation Data Manager examines the issue of validation of data carefully.





To validate data quality OPTEX has Check Integrity IDIS service, which can be accessed from OPTEX explorer via the right click of the mouse.







As a result, the DATA_VALIDATION.LOG report is obtained, it contains all errors reported by OPTEX taking into account validation rules implemented by the modeler.

OPTEX - d:\Dropbox\genex\vr	p\vrpwo\DATA_VALIDATION.	LOG			_		×
						Септа	r
RECREANDO: NODOS							^
08:35:41 Creando campo: COD_NOD							
08:35:41 Creando campo: COD_NOD1 08:35:41 Creando campo: DES_NOD							
08:35:41 Creando campo: TIPO							
08:35:41 Tabla Original: d:\Dropbox\ge	nex\vrp\vrpda\NODOS.DBF - 1	abla Destino: d:\Dropbox	\genex\vrp\vr	pwo\NODOS.DBF			
08:35:41 Campo Clave: COD_NOD				# EBBOR			
08:35:41	ONTENIDO	DESCRIPCION ERROR		# ERROR			
RECREANDO: PEDIDOS							
08:35:41 Creando campo: COD_PED							
08:35:41 Creando campo: DES_PED							
08:35:41 Tabla Original: d:\Dropbox\ge	nex/vm/vmda/PEDIDOS DBE	Tabla Destino: d:\Dropbo		vmwo\PEDIDOS DBE			
08:35:41 Campo Clave: COD_PED			a gonoa arp i	ipho i Ebiboo.bbi			
REGISTRO CAMPO C	CONTENIDO	DESCRIPCION ERROR		# ERROR			
08:35:42							
08:35:42 Creando campo: COD_VEH							
08:35:42 Creando campo: DES_VEH							
08:35:42 Creando campo: CAPP							
08:35:42 Creando campo: CAPV							
08:35:42 Creando campo: COVA							
08:35:42 Tabla Original: d:\Dropbox\ge	nex\vrp\vrpda\VEHICULOS.DE	F - Tabla Destino: d:\Drop	box\genex\v	p\vrpwo\VEHICULOS.DBF			
08:35:42 Campo Clave: COD_VEH				# 59909			
2 DES VEH NHR	.ONTENIDO Duplicida	DESCRIPCION ERROR	200	# ERROR			
3 DES VEH NHR	Duplicida	id en Campo	200				
4 DES_VEH NHR	Duplicida	id en Campo	200				
6 DES_VEH NKR	III Duplicida	d en Campo	200				
9 DES VEH NRR	III Duplicida Duplicida	d en Campo d en Campo	200				
10 DES_VEH NPR	Duplicida	ad en Campo	200				
11 DES_VEH NHR	Duplicid	ad en Campo	200				
13 DES_VEH NHR	Duplicid	ad en Campo ad en Campo	200				
16 DES VEH NKR	II Duplicida	ad en Campo ad en Campo	200				
17 DES_VEH NKR	II Duplicida	ad en Campo	200				
18 DES VEH NKR	II Duplicida	ad en Campo	200				~





In addition to the report, OPTEX generates tables with the errors that the modeler can review from OPTEX-GUI accessing to the window associated with the Data Tables.

Errors of integrity found in the different tables are then analyzed. So it is suggested to review the menu of Data Model window associated with Database Errors in which there are tables with errors and the records within each table.





Analyzing the errors databases are the report of three tables: CAJAS, ESC_PED and VEHICLES. The reason for the errors is then analyzed.







To avoid mistakes such as those presented and improve the quality of the data, some validation rules, will be adjusted including rule F:

F Referential integrity, not to allow empty fields and requires the existence of all the codes/keys for the master table in the field in the table being validated.

This rule applies to the following couples table-field:

- **PEDIDOS COD_CLI**: implies that they may not exist orders without a client (node) assigned and that there must be at least one order for each customer.
- PED_CAJ COD_PED: implies that there has to be at least one box type assigned to each order.
- PED_CAJ COD_CAJ: implies that there has to be at least one order assigned to the type of box.
- NOR_VEH COD_VEH: implies that for any vehicle there must be a warehouse assigned.
- NOD_NOD COD_NOD: implies that for any vehicle there is at least one node destination to which it can go.
- NOD_NOD COD_NOD1: implies that for all node there is at least one origin node which can be arrived from.
- VEH_NOD COD_VEH: implies that for all node there is at least one node which can go to.
- VEH_NOD COD_NOD: implies that or all node there is at least one vehicle that can visit it.



Corrections in the data tables may be held at OPTEX-GUI and are subsequently exported to a template to keep the data in the EXCEL template.

The PEDIDOS.csv and PED_CAJ.csv tables were obtained from other sources and it was imported into the IDIS through import of text files. The tables used are available from the following URLs:

- http://www.doanalytics.net/Documents/PEDIDOS.csv.xlsx
- http://www.doanalytics.net/Documents/PED_CAJ.csv.xlsx

The new template, including new validations are located at the following URL:

http://www.doanalytics.net/Documents/OPTEX_Plantilla_Modelo_VRP_6.xlsx





The next step is to conduct a new analysis of integrity, with new tables and new validations, resulting in the report DATA_VALIDATION_1.LOG which is located at the URL:

http://www.doanalytics.net/Documents/DATA_VALIDATION_1.LOG

DAT/	A_VALIDATION_1	.LOG: Bloc de notas			_	×
<u>A</u> rchivo	<u>E</u> dición F <u>o</u> rm	nato <u>V</u> er Ay <u>u</u> da				
	RECREANDO:	ESC_CAJ				~
06:11:2	20 Creando ca	mpo: COD_CAJ				
06:11:2	1 Tabla Orig	inal: d:\Dropbo>	<pre>(\genex\vrp\vrpda\ESC_CAJ.DBF -</pre>	Tabla Destino: d:\Dropbox\genex\vrp\vrpwo\ESC_CAJ.DBF		
06:11:2	21 Campo Clav	e: -				
	REGISTRO	CAMPO	CONTENIDO	DESCRIPCION ERROR	# ERROR	
06:11:2	21					
	RECREANDO:	NODOS				
06:11:2	21 Creando ca	mpo: COD_NOD				
06:11:2	21 Creando ca	mpo: COD_NOD1				
06:11:2	21 Creando ca	mpo: DES_NOD				
06:11:2	21 Creando ca	mpo: TIPO				
06:11:2	21 Tabla Orig	inal: d:\Dropbo>	<pre>(\genex\vrp\vrpda\NODOS.DBF - Ta)</pre>	abla Destino: d:\Dropbox\genex\vrp\vrpwo\NODOS.DBF		
06:11:2	21 Campo Clav	e: COD_NOD				
	REGISTRO	CAMPO	CONTENIDO	DESCRIPCION ERROR	# ERROR	
06:11:2	21					
	RECREANDO:	PEDIDOS				
06:11:2	21 Creando ca	mpo: COD_PED				
06:11:2	21 Creando ca	mpo: DES_PED				
06:11:2	21 Creando ca	mpo: COD_NOD				
06:11:2	21 Tabla Orig	inal: d:\Dropbo>	<pre>(\genex\vrp\vrpda\PEDIDOS.DBF -</pre>	Tabla Destino: d:\Dropbox\genex\vrp\vrpwo\PEDIDOS.DBF		
06:11:2	21 Campo Clav	e: COD_PED				
	REGISTRO	CAMPO	CONTENIDO	DESCRIPCION ERROR	# ERROR	
	5	COD_NOD	860007336-34	Integridad en Campo	101	
	6	COD_NOD	860013570-2	Integridad en Campo	101	
	7	COD_NOD	860013570-8	Integridad en Campo	101	
	8	COD_NOD	860013570-9	Integridad en Campo	101	
	9	COD_NOD	860013570-23	Integridad en Campo	101	
	10	COD_NOD	860013570-50	Integridad en Campo	101	
	11	COD_NOD	860013570-34	Integridad en Campo	101	
	12	COD_NOD	860013570-35	Integridad en Campo	101	
	13	COD_NOD	860013570-36	Integridad en Campo	101	~
<						>





This report presents problems of integrity for the following tables: NOR_VEH, PED_CAJ, PEDIDOS and VEH_NOD. The problems are:



1. TABLE: NOR_VEH

The problem lies in the fact that there are codes of vehicles (**COD_VEH**) for which is not assigned origin warehouse. Solution remove reported vehicles of the master **VEHICULOS** or complete the table **NOR_VEH**. Solution remove the masters existing codes.

The image shows invalid records in the **NOR_VEH** table. There is no one.

2. TABLE: PED_CAJ

The problem lies in the fact that there are boxes codes (**COD_CAJ**) and codes of the orders (**COD_PED**) that are not listed in their respective master tables. Also reports that there are orders for which there are no assigned boxes. Solution delete invalid records and perform integrity analysis.

The image shows invalid records in the table **PED_CAJ**, which will be deleted.

	Tabla: d:\Dropbox\genex\vrp	\vrpda\NOR_VEH.DBF	🚰 Database Er					
Table	Cod_Nod: Cod_Veh:		Table	Field	Register	Description	Content	Error
NOR_VEH	Provine Tabla		NOR_VEH	COD_VEH	0	ID Maestro CON001 NO se encuentra en Campo COD_VEH	CON001	701
PED_CAJ	Sites Resister Invelider		NOR_VEH	COD_VEH	0	ID Maestro CON002 NO se encuentra en Campo COD_VEH	CON002	701
PEDIDOS	Hitrar Registros Invalidos		NOR_VEH	COD_VEH	C	ID Maestro CON003 NO se encuentra en Campo COD_VEH	CON003	701
VEH_NOD F	Filtrar Registros Validos		NOR_VEH	COD_VEH	0	ID Maestro CON004 NO se encuentra en Campo COD_VEH	CON004	701
	Ubicar Registro Invalido		NOR_VEH	COD_VEH	0	ID Maestro CON005 NO se encuentra en Campo COD_VEH	CON005	701
			NOR_VEH	COD_VEH	0	ID Maestro CON006 NO se encuentra en Campo COD_VEH	CON006	701
			NOR_VEH	COD_VEH	0	ID Maestro CON007 NO se encuentra en Campo COD_VEH	CON007	701
			NOR_VEH	COD_VEH	0	ID Maestro CON008 NO se encuentra en Campo COD_VEH	CON008	701
			NOR_VEH	COD_VEH	0	ID Maestro CON009 NO se encuentra en Campo COD_VEH	CON009	/01
			NOR_VEH	COD_VEH	0	ID Maestro CONUIU NO se encuentra en Campo COD_VEH	CONUTO	701
			NOR_VEH	COD_VEH	0	ID Maestro CONU11 NO se encuentra en Campo COD_VEH	CONUT1	/01
			NOR VEH	COD_VEH		ID Maestro CON012 NO se encuentra en Campo COD_VEH	CONU12	701
			NOR_VEH	COD_VEH	0	ID Maestro CONULS IVO se encuentra en Campo COD_VEH	CONU13	701
			NOR VEH	COD_VEH		ID Meetro CON014 NO se encuentra en Campo COD_VEN	CON014	701
			NOR VEH	COD_VEH		ID Maestro CON015 NO se encuentra en Campo COD_VEH	CON015	701
			NOR VEH	COD VEH		ID Meeting COND17 NO se encuentra en Campo COD_VEH	CON017	701
			NOR VEH	COD VEH	0	ID Maastro CON017 NO as encuentra en Campo COD_VEH	CON018	701
			NOR VEH	COD_VEN		ID Massire CONDIG NO se encosite en Campo COD_VEN	CONDID	701
c >								
CENEX-VRP - Databb GENEX-VRP - Databb Archivo Edición Ve	ase Errors Asis Ver Ayuda (24) Held Hel Dall X (25)			o 14 24 24 24 24 24 24 24 24 24 24 24 24 24	* 2	13 🔟 40 49 40 12 2 12 40 40 40 40 40 40 40 40 40 40 40 40 40		05:13:18 p. n 1 ESP 5:13 p 0
<	es como Invalidos es como Invalidos es Errors e Análicia Ver Apuda es Intel el Info Intel In		E Ž↓ X↓ @ Totabase E	<u>0</u> 2 M (<u>★ ()) (A₀ 2</u> rors	* *	■ <u>₩</u> Σ <u>²</u> 2 9 9		05:13:18 p. n 3 ESP 5:13 p - 0
<	es como invalidos es como invalidos es Errors r Análias Ver Ayuda (a) Hel (H) (H) (H) (K) (K) (b) Al (H)		E 24 X4 00 Table	2	* 🧟	11 ···································	Content	05:13:18 p. n 559 5:13 p 0 Enor
Aregistros Reportad CeNEV. VRP - Datable CENEV. VRP - Datable CENEV. VRP - Datable CENEV. VRP - Datable Table NOR_VEH	See come invalides See come invalides See come a calitation Ver Ayuda See come invalides See come inv		E 24 XJ 00	© ¹³ (2	* 🔌	(1) 4월	Content 160-121	05:13:18 p. n ESP 5:13 p C Error 101
A A A A A A A A A A A A A A A A A	de como invuidos esce Erros: ana Erros: ana Erros: ana Hell Hel Jack XIII Alexandro de Carlos Alexandro Carlos Pade Cod, Carlos De Carlos Alexandro De Carlos Alexandro		E 24 XJ 00 Database E Table FED_CA PED_CA		* Register	ti a constanti a c	Content 160:121 352:121	05:13:18 p. n ESP 5:13 p — CP
C >>	50 como invalidos 50 como invalidos 50 como invalidos 1 milio Ver Ayuda 3 milio Ver		E Database E Table FED_CAJ FED_CAJ	Image: Conjunction Image:	Register	t a ta	Content 160121 255-121 255-121	05:13:18 p. n 1 ESP 5:13 p - 07 Error 101 101
C >> Tra Registros Reportas Tra Registros Reportas C P - Databia C P - Databia C - Databia C - Databia NOR_VEH	Se como invalidos Se como invalidos ase Erros ar Antilias Ver Apuda Bi Hel 41 b+ 341 ¥ B4 Di 14 b+ 341		E Database E Table FED_CAJ FED_CAJ FED_CAJ	∑2 XX XK Image: Amage of the second secon	* 2 Register 16 27 45	Competence and compet	Cortext 160121 350121 205121 205121 205121	05:13:18 p. n (05:13:18 p. n (10)
C C C C C C C C C C C C C C C C C C C	es como invuidos see Errors a Análisis Ver Aguda Ser Inter Aguda Ser Inter Aguda Ser Inter Aguda Ser Inter Aguda Ser Inter Aguda Fitter Aggintos Ivalidos Fitter Aggintos Ivalidos		ELANA DALASSE E Table FED_CAJ FED_CAJ FED_CAJ	B2 M S M S M S Med COD_CAL COD_CAL COD_CAL COD_CAL COD_CAL COD_CAL COD_CAL COD_CAL COD_CAL COD_CAL COD_CAL	* Register 16 22 45 50	t a ta	Content 160:121 250:121 250:121 259:121 259:121	05:13:18 p. n 257 5:13 p - 07 Error 101 101 101 101
CENEX-VRP - Databi CENEX-VRP - Databi rchivo Edición Ve CAN - CAN FED CAN FED CAN FED DOS VEH_NOD	de como invuides et como invuides et al. Ref. Ver. Ayuda ase Erros r Andias Ver. Ayuda ase <u>invert de la bertaina</u> <u>ase Anno 100000000000000000000000000000000000</u>		E 21 X1 00 Table TeD_CA FED_CA FED_CA FED_CA FED_CA	№ №	* Register	Composition C	Contert 160121 352-121 352-121 352-121 352-121 352-121 352-121	(05:13:18 p. m) ESP 5:11 p - 07 Emer 101 101 101 101 101 101
CENEX-VRP - Databa GENEX-VRP - Databa rchivo Edición Ver Contexto - Databa rchivo Edición Ver Table Table PEDIDOS VEH /NOD	es como invuides see Errors s Analisis Ver Ayuda S Analisis Ver Ayuda S Hale al the Job X K Ra Teleformer S Assars Teleformer S A		E ▲1 × ↓ ③ E ▲1 × ↓ ④ FED_CA FED_CA FED_CA FED_CA FED_CA FED_CA FED_CA		* * * Register 16 27 45 500 65 72 72 72 72 72 72 72 7		Content 160 121 355-121 255-121 255-121 255-121 255-121 255-121 255-121 255-121 255-121 255-121 255-121 255-121	(05:13:18 p. n. n 1 259 5:13 p - 0
<	Jos como invuisios El Mail Image: Comparison of the state of the st			Bit M M IIII IIIII M IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	* Register	Compare a c	Context 10117 355-271 355-271 355-271 355-271 355-271 355-271 355-271 355-271 355-271	05:13:18 p.m. 15:29 5:13 p - 07 -
<	es como invalidos es como invalidos es como invalidos es como invalidos es como invalidos este fonos este f		■ ▲ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	Image: Second	* 2 Register 16 27 45 55 65 77 25 65 72 30 80 80 80 80 80 80 80 80 80 8	E a a a a a a a a a a a a a a a a a a a	Cortest Cortes	05:13:18 p. n. 7 05:13:18 p. n. 7 5:09 5:13 p - 0 0 0 0 0 0 0 0 0 0 0 0 0 0
<	Se como invuides Se como invuides Se Erros r Anidia: Ver Ayuda Se Intel 4(1+) >34 Se Intel 4(1+) >34			№ №	Register E 16 15 1 16 27 45 50 65 72 74 80 81	Comparing a company of the company o	Contest 0 10 10 50-10	05:13:18 p. n 15:29 5:13 p - 07 5:10 5:10 5:13 p - 07 5:13 p - 07 5:15 p - 0
C A Rejatica Reportar C Re	es como invuídos ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■		E 241 X ↓ ① Table FED CAA FED CAA FED CAA FED CAA FED CAA FED CAA FED CAA FED CAA FED CAA	€2 50 Feed COD_CAL COD_CAL COD_CAL	Register Begister C	E a a a a a a a a a a a a a a a a a a a	Cortert Cortert Cortert Cortert Cortert Solv21 295-21 295-21 295-21 295-21 295-21 295-21 29	05:13:18 p. n 1 (50) 5:13 p. - 0) - 0)
C Parameter Construction Constr	Les como invuilles Les c		E Datase E Take TRD_CA FED_CA FED	© X Image: C_A_B 2 M Image: C_A_B Image:	* Register	Decopion	Cortest 0 10 10 350-101 350	051318 p. n. 051318 p. n. 102 51318 p. 102 51318 p. 103 51318 p. 10
Construction Reporters Construction Reporters Construction Constructi	es como invalidos anas Erros:			№ ∞ ∞ ∞ N ∞ <td< td=""><td>* Register Register 16 50 65 77 74 80 90 91 91 92 92 92 92 92 92 92 92 92 92</td><td>E Constantino de la constantin</td><td>Context Context Con</td><td>05:13:18 p. n 1 250 3:13 p. - 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td></td<>	* Register Register 16 50 65 77 74 80 90 91 91 92 92 92 92 92 92 92 92 92 92	E Constantino de la constantin	Context Con	05:13:18 p. n 1 250 3:13 p. - 0 0 0 0 0 0 0 0 0 0 0 0 0 0
C > 2 Registres Reporter C P Registres Reporter C P D C C C C C C C C C C C C C C C C C	Les cemes invuitides		E Di Xi Colore E Traie FED CAN FED CAN	© № ∑ A ₁ S N III III IIII IIIII IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	* • • • • • • • • • • • • • • • • • • •	D D D D	Cortest 0 19 19 350-121 350	051318 p. n. 122 513 18 p. n. 122 513 19 0 00 0

PED_CAJ

PED CAJ

PED_CAJ

PED_CAJ

PED CAJ

PED CAL

PED CAJ

PED_CAJ

PED CAJ

PED_CAJ

PED CAJ

PED_CAJ

PED_CAJ

COD CAJ

COD CAJ

COD_CAJ

COD_CAJ

COD CAJ

COD CAL

COD CAJ

COD_CAJ

COD CAJ

COD_CAJ

COD CAJ

COD_CAJ

COD_CAJ

os 🛤 🗚

118 Integridad en Carro

119 Integridad en Campo

128 Integridad en Campo

129 Integridad en Camp

130 Integridad en Campo

131 Intentidad en Carros

132 Integridad en Campo

134 Integridad en Campo

135 Integridad en Campo

137 Integridad en Campo

140 Integridad en Campo

141 Integridad en Campo

142 Integridad en Camp

🚅 🔎 🗊 📷 📓 🔤 👜 🧕 🗃 🕸 🙋 🙆 🧉 🛸

128749-121 252-12

128749-121

14224-127

148-119

148-119

149-119

154-119

172824-110 2230-110

172824-110 2750-110

172829-110 2750-110

72834-110 2750-110

172837-110

72837-110 340-110

352-121

8426920010189-1

100001-119

100002-119

100002-119

100001-119

320-110

252-12

352-121

8426920010189-1

100001.119

100002-119

100002.119

100001-119

2230-110

2750-110

2750-110

2750-110

320-110

340-110

101



TABLE: PEDIDOS 1.

The problem lies in the fact the codes are of clien (COD NOD) that are not their respective master table is reported that there is a cu 8300251421-0, for which t no orders, which is correct s node corresponds to the wa Solution delete invalid reco perform integrity analysis.

The image shows invalid re the ORDERS table, which deleted.

2. TABLE: VEH NOD

The problem lies in the fact the are codes of vehicles (COD_) which is not assigned warehouse. Solution remo reported vehicles of the VEHICULOS table or comp VEH NOD table. These coine reported errors for the table. delete from master table the codes.

The image shows invalid re the VEH_NOD table. The one.

	😂 📱 Tabla: d\D	ropbox\genex\vrp\vr	pda\PEDIDOS.D	DBF 💿 💌	Database E	mors				
	Cod_Ped:	Des_	Ped:	Cod_Nod: ^	Table	Field	Register	Description	Content	Error
CIC NOR_VEH	129244121	126244-121 - 86000	2670.2	9600135570.2	PEDIDOS	COD_NOD	196	Integridad en Campo	890107487-15	101
	100010 101	100040 101 00001	3570-8	860013570-8	PEDIDOS	COD_NOD	137	Integridad en Campo	890107487-24	101
VEH_NOD	Browse Tabla		3570-9	860013570-9	PEDIDOS	COD_NOD	199	Integridad en Campo	890107487-24	101
in	Filtrar Registro	s Invalidos	3570-23	860013570-23	PEDIDOS	COD_NOD	200	Integridad en Campo	890107487-40	101
	Filtrar Registro	s Validos	3570-50	860013570-50	PEDIDOS	COD_NOD	211	Integridad en Campo	890107487-17	101
oit I	Ubicar Registri	120055 121 00001	3570-34	860013570-34	PEDIDOS	COD_NOD	212	Integridad en Campo	890107487-17	101
	128656-121	128656-121 - 86001	3570-35	860013570-36	PEDIDOS	COD_NOD	213	Integridad en Campo	860002095-27	101
ner 📗	128661-121	128661-121 - 86001	3570-45	860013570-45	PEDIDOS	COD_NOD	215	Integridad en Campo	860002095-26	101
	128662-121	128662-121 - 86001	3570-47	860013570-47	PEDIDOS	COD_NOD	216	Integridad en Campo	860002095-62	101
are	128663-121	128663-121 - 86001	3570-48	860013570-48	PEDIDOS	COD_NOD	217	Integridad en Campo	860002095-62	101
	128664-121	128664-121 - 86001	3570-52	860013570-52	PEDIDOS	COD_NOD	218	Integridad en Campo	860002095-27	101
his I I	128667-121	128665-121 - 86001	3570-53	860013570-60	PEDIDOS	COD_NOD	219	Integridad en Campo	860002095-3	101
	128749-121	128749-121 - 86000	17336-30	860007336-30	PEDIDOS	COD_NOD	221	Integridad en Campo	860002095-74	101
ise.	128766-121	128766-121 - 86000	7336-2	860007336-2	PEDIDOS	COD_NOD	222	Integridad en Campo	860002095-74	101
	14224-127	14224-127 - 890107	487-3	890107487-3	PEDIDOS	COD_NOD	226	Integridad en Campo	860002095-56	101
and	148-119	148-119 - 89010748	17-11	890107487-11	PEDIDOS	COD_NOD	227	Integridad en Campo	860002095-56	101
	149-119	149-119 - 86000209	5-3	860002095-3	PEDIDOS	COD_NOD	228	Integridad en Campo	860002095-28	101
	172824-110	172824-110 - 86001	3570-44	860013570-44	PEDIDOS	COD_NOD	229	Integridad en Campo	860002095-28	101
	172829-110	172829-110 - 86001	3570-3	860013570-3	PEDIDOS	COD_NOD	230	Integridad en Campo	860013570-16	101
	172830-110	172830-110 - 86001	3570-16	860013570-16	PEDIDOS	COD_NOD	236	Integridad en Campo	860013570-28	101
	172834-110	172834-110 - 86001	3570-40	860013570-40	PEDIDOS	COD_NOD	237	Integridad en Campo	860013570-47	101
in 📗	172837-110	172837-110 - 86001	3570-43	860013570-43	PEDIDOS	COD_NOD	238	Integridad en Campo	860013570-52	101
,	172838-110	172838-110 - 86001	3570-39	860013570-39	PEDIDOS	COD_NOD	239	Integridad en Campo	860013570-50	101
ha	1/2039-110	1/2033-110 - 00001	3370-20		PEUIDUS	ICOD NOD	243	precipitad eo L'attion	830107487-3	101
GENEX-VRP - I Archivo Edición	> 172841-110	172841-110 - 86001	3570-44		PEDIDOS		0 * • •	10 Meestro 3000251421-0 NO se encuentra en Campo COO_N 10 🧰 🐵 🛥 🍖 💐 🜒 🦧 (40) 🐠	00 8300251421-0	701 05:27:00 E ESP 52 - 69
	> 172841-110 Database Errors h Ver Análisis Ver	172841-110 - 86001	3570-44					10 Marto 2002514210 ND se encuerta en Carpo COO JA 1 : 이 ' 이 ' 이 ' 이 ' 이 ' 이 ' 이 ' 이 ' 이 ' 이	00 8300251421-0	701 05:27:00 E ESP 52 - E9
DC	> 172841-110 Database Errors h Ver Anälisis Ver E B A H44 441 Cod Veh	172841-110 - 86001 Ayuda → >>> ▲ ● >>> ▲ ● @ @ ropbox/genex/vrp/vr	3570-44		PEDIDOS	COD_NOD	0 3 2 3 Begister	10 Mento 8002514210 NO se encuerta en Carpo COO JK	00 8300251421-0	701 05:27:00 ESP 5: - 0
	> 172841-110 Database Errors n Ver Anälisis Ver E B A H44 441 Cod_Veh:	172841-110 - 86001 Ayuda → ▷N & @ @ ropbox/genex/vrp/vr Cod_Nod: (3570-44		PEDIDOS	COD_NOD	Register	10 Meetro 80002514210 ND se encuerta en Carpo CCO JK 1	00 8300251421-0	701 05-27:00 (ESP 52 - C Ener 701
ere	> 172841-110 Database Errors Ner Análísis Ver B B A Idd 441 Cod_Veh	172841-110 - 66001 Ayuda ▶ ▷M & B @ @ Cod_Nod: (C	3570-44		PEDIDOS	COD_NOD COD_NOD COD_NOD COD_NOD COD_NOD COD_VEH COD_VEH COD_VEH	Register 0	0 Maeste 2002514210 ND se encuenta en Carpo COO_JA 1 <	DD 8300251421-0	701 05:27:00 ESP 5: - C0 Error 701 701
ere for PEDIDOS	> 172841-110 Database Errors a Ver Análisis Ver E S Ald 440 Cod_Vek:	172841-110 - 96001 Ayuda ► ▷M & E Cod_Nod: (3570-44		PEDIDOS	COD_NOD 01 02 24 25 26 27 28 29 20 21 22 23 24 25 26 27 28 29 29 20 21 22 23 24 25 26 27 28 29 29 20	8 2 1	D Nexto 2002514210 ND se encuerta en Carpo COO JK	DD 8300251421-0	701 05-27:00 ESP 5-2 - C9 Error 701 701 701 701
ere for for	> 172841-110 Database Errors Ver Análisis Ver Gel (2014) Ver Análisis Ver Cod (Vet: Browse Tabla	172841-110 - 96001 Ayuda → ▷≫l ▲ ➡ @ Cod_Nod: (3570-44		PEDIDOS	COD_NOD COD_NOD COD_NOD COD_VEN COD_VE		Difference Billing Total Billing Tot	D0 8300251421-0	701 05:27:00 ESP 52 - C Error 701 701 701 701 701 701 701
ere for iqin	> 172841-110 Database Errors Wer Análisis Ver B S 1441 4413 Table drift Cod, Ver: Database Color Cod, Ver: Cod, Ver:	172841-110 - 86001 → 37404 → 37404	3570-44		PEDIDOS		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	D Maetro 600251421-0 ND se encuerte en Carpo COO_JA Image: Ima	Context Context CON002 CON003 CON004 CON005 CON005	701 05:27:00, 559 500 500 500 701 701 701 701 701 701 701
ere for igin	> 172841-110 Database Errors Ver Análisis Ver Browse Tabla Browse Tabla Browse Tabla	172841-110 - 96001 Ayuda >>>>> >>>>>> Image: State of the s	3370-44		PEDIDOS ■ ● I × I ● ■ Database E ■ ■ Database I ■ ■ Database I ■ ■ Database I ■ ■ Database I ■ ■ NH NOD ■	COD_NOD Image: Control of the second seco		D Meetro 2002514210 ND se encuerte en Carpo COO JK Descrito 2002514210 ND se encuerte en Carpo COO JK Descrito 2002 ND en cuerte en Carpo COO JK Descrito 2002 ND en cuerte en Carpo COO JKE Descrito 2003 ND en cuerte en Carpo COO JKE	DD 8300251421-0 R R R CON001 CON002 CON003 CON003 CON005 CON006 CON006 CON006	701 05:27:00 5:59 5:59 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50 5:50
ere for igin the	> 172841-110 Database Error Wer Análisis Ver Distabase Error Mer Análisis Ver Distabase Error Mer Análisis Ver Distabase Error Mer Análisis Ver Distabase Error Distabase Error Distab	172841-110 - 86001 Ayuda ▶ ▶ ▶ ▲ ▶ ▶ ▲ Senet varptvar Cod_Nod: Cod_Nod: Os Invalidos os Invalidos os Invalidos	3570-44		PEDIDOS ■ ▲1 (X,i) (III) ■ ● 1 (X,i) (III) ■ ● Database E Table VEH_NOO VEH_NOO VEH_NOO VEH_NOO VEH_NOO VEH_NOO VEH_NOO VEH_NOO VEH_NOO VEH_NOO VEH_NOO VEH_NOO VEH_NOO VEH_NOO	COD_NOD 33 X4 34 X5 74 X6 75 Feld COD_VEH COD_VEH		0 Hearts 5002514216 ND are inclured on Campo COULIN 1 0 1 2 1 1 0	D0 8300251421-0 Image: I	701 05:27:00, 05:27:00, 05:27:00, 05:27:00, 001 701 701 701 701 701 701 701
ere for the	> 172841-110 Database Error: a Ver Análisis Ver E Análisis Ver E Med 444 E Med 444 E Med 440 E Med 444 E Med 440 E Med 444 E Med 444	172841-110 - 56001 Ayuda ▶ ≫ X № № ▶ ≫ X № S Invelidos os Invelidos os Invelidos	2570-44		PEDIDOS E & K U Database E Tabe VEH_NOO	COD_NOD 61 X 7 Max 7 Max <		10 Maetro 500251421-0 ND se encuerte en Carpo COO_JAN 11 Maetro 12 Maetro 12 Maetro 12 Maetro 12 Maetro 12 Maetro 12 Maetro 12 Maetro 10 Maetro 10 Maetro 10 Maetro 10 Maetro	Context CON1003 CON1003 CON1003 CON1005 CON1005 CON1005 CON1005 CON1005 CON1005 CON1005 CON1005 CON1005 CON1005	701 05:27:00 0
ere for the ster	172841-110 10	Ayuda Image: Control of the control of th	2570-44		PEDIDOS E 21 X J 30 C Database E Tale VEH, NOO	COD_NOD Q3 X4 W Image: Angle of the second seco	Register 0	D Heato 2002514210 ND se encuents en Carpo COO JK Description Descri	ID 8300251421-0 ID 8300251421-0 ID ID <	701 05-27:00 5 ESP 52 - 09 Emer 701 701 701 701 701 701 701 701
ere for gin the ster	> 172841-110 Database Errors Ver Analisis Ver E Analisis Ve	Ayuda + DAI S He C Ayuda + DAI S He C constructions construct	2570-44		PEDIDOS PEDIDOS Database E Table VEH_VICO	COD_NOD 82 20 82 20 82 20 82 20 82 20 82 20 82 20 82 20 82 20 82 20 82 20 82 20 82 20 82 20 82 20 82 20 83 20 84 200 94 200 95 200 95 200 95 200 95 200 95 200 95 200 95 200 95 200 95 200 95 200 95 200 95 200 95 200 95 200 95 <td></td> <td>0 Hearts 5002514210 ND se incurrents in Campo COOL JA 1 0 1 2 1 2 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 1 0 1 0 1 0 1 0 1 1 0 1 <t< td=""><td>D 200251421-0</td><td>701 05:27:00, 259 52 - 09 - 09 -</td></t<></td>		0 Hearts 5002514210 ND se incurrents in Campo COOL JA 1 0 1 2 1 2 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 1 0 1 0 1 0 1 0 1 1 0 1 <t< td=""><td>D 200251421-0</td><td>701 05:27:00, 259 52 - 09 - 09 -</td></t<>	D 200251421-0	701 05:27:00, 259 52 - 09 -
ere for gin the ter the	> 172841-110 Database Errors Ver Análisis Ver Errors Table Brouse Table Filtra Rejetr Uticar Rejetr	172841-110 - 86001 2 0 Ayuda Ayuda Status Cod Jebd Cod Jedd Cod Jedd Col walidos co Invalido	33570-44		PEDIDOS PEDIDOS PEDIDOS Database E Table VEH_NOO	COD_NOD R </td <td></td> <td>D Meetro 2002514210 ND se incurrents in Carpo COO_JM Decorption Company Control (Control (</td> <td>D 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>701 05:27:00 05:27:00 05:27:00 05:27:00 701 701 701 701 701 701 701 7</td>		D Meetro 2002514210 ND se incurrents in Carpo COO_JM Decorption Company Control (Control (D 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	701 05:27:00 05:27:00 05:27:00 05:27:00 701 701 701 701 701 701 701 7
ere for gin the ster the	> 172841-110 Database Errors Ner Análisis Ver Análisis Ver Análisis Ver Cod_Veh: Browse Tabla Filter Registr Ubicar Registr	172841-310-86001 Ayuda Ayuda ▶ J>M Second generative region Code_Blad Code_Blad Se lavalides Se lavalides	33 0 × 10 × 10 × 10 × 10 × 10 × 10 × 10		PEDIDOS ■ €1 [X] ■ ■ 0x80x82 ■ ■ 0x80x92 ■ ■ 0x80x92 ■ ■ 0x80x92 ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■	COD_HOD 23 X4 24 25 X4 25 24 25 26 25 24 27 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26 200 26 26		0 Hearts 5002514210 ND as encounts on Campo COULM 1 0 1<	Content C	701 05:27:00 (05:27:00 (0
ere for gin the ster the vith	172841-110 12841-110	172841-110-86001 22 ● Apuda 4 ● 93 ▲ 93 ▲ 93 ▲ 93 ▲ 93 ▲ 93 ▲ 93 ▲ 94 ● 95 ▲ 95 ▲ 96 ● 96 ● 96 ● 96 ● 96 ● 96 ● 96 ● 97 ● 98 ■ 98 ■ 98 ■ 98 ■ 98 ■ 98 ■ 98 ■ 98 ■ 98 ■ 98 ■ 98 ■ 98 ■ 98 ■ 98	33570-44		PEDIDOS ■ ▲1 ※.1 ● ■ ▲1 ※.1 ● ■ ▲1 ※.1 ● ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■	COD_HOD 23 24 24 25 24 25 24 25 26 26 26 27 26 26 28 27 844 COD_VEH COD_VEH COD_VEH	Comparison of the second	D Maetro 500251421-0 ND are incurred in Campo COOL JA Image: I	Content	701 05:27:00 0
ere for gin the ster the vith	> 172841-110 Database Errors Ver Analisis Ver ©	Interface Apuda Apuda Apuda Apuda Apuda Bala Apuda Bala Bala Bala Bala Cod_Bod Co	3570-44		PEDIOOS PEDIOOS ■ ●	COD_HOD S3 XX S4 S2 Feld S2 COD_VEH COD_VEH	Comparison of the second	D Meetro 2002514210 ND se encuerts en Carpo COO_H4 Description Desc	D0 289251421-0 Cortest Cortest Cortest Control Co	701 05:27:00 05:27:00 0
ere for gin the ster the vith ion	> 172841-110 Database Errors Ner Analisis Ver Print Analisis Ver Print Print Pri	172841-110 - 8600 1 12841-110 - 8600 1	3570-44		PEDIDOS PEDIDOS ■ 24 (X4) (Q) ■ 0 atabase E VEH, NOC VEH, NO	COD_HOD Image: CoD_HOD		0 Hearts 5002514216 ND as encounts on Campo COU_JM 1 0 Hearts 5002514216 ND as encounts on Campo COU_JM 1 0 Hearts 5002514216 ND as encounts on Campo COU_JM 1 0 Hearts 500251421 N and the counts on Campo COU_JM 1 Hearts 500251421 N and the counts on Campo COU_JM 1 Hearts 5000511 N and the counts on Campo COU_JM 1 Hearts 5000511 N and the counts on Campo COU_JM 1 Hearts 5000511 N and the counts on Campo COU_JM 1 Hearts 5000511 N and the counts on Campo COU_JM 1 Hearts 5000511 N and the counts on Campo COU_JM 1 Hearts 5000511 N and the counts on Campo COU_JM 1 Hearts 5000511 N and the counts on Campo COU_JM 1 Hearts 5000511 N and the counts on Campo COU_JM 1 Hearts 5000511 N and the counts on Campo COU_JM 1 Hearts 5000511 N and the counts on Campo COU_JM	Content C	701 05-27-00 (05-27-0
ere for record the ster the vith tion in a	> 172841-110 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	172841-110-86001 2 ● Apuda Apuda Set (abs)	3570-44		PEDIDOS PEDIDOS E 21 X1 00 F 241 X1 00 F 241 X00 F	COD_HOD 32 24 32 24 76 24 76 24 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 77 74 78 74 78 74 78 74 78 74 78 74 78 74 78 74 78 74 78 74 78 74 78 74 78 74 78 74 78 74 78 74 78 74		D Maetro 2002514210 ND se encuents en Carpo COO, M Description D	Context C	701 05:27:00 (05:27:00 (05:27:00 (05:00)) 05:27:00 (05:00) 05:27:00 (05:00) 05:27:00 (05:00) 00:00 00:00 00:00 701
ere for igin the ster the vith tion ting	> 172841-110 Database Errors Ver Analisis Ver Print Analisis Ver Print Analisis Ver Print Analisis Ver Print Analisis Ver Print Analisis Print Analisi	172841-110 - 8600	9570-44		PEDIDOS PE	COD_HOD 22 24 25 26 27 28 2002/COD_VEH COD_VEH		0 Martine 15002514214 ND as encountes on Campo COO, JM 1 Image: Cool (Cool	Control Contro Control Control Control Control Control Co	701 701 (05.270.0,02) 52 (1

This report presents problems of integrity for the following tables: NOR_VEH, PED_CAJ, **PEDIDOS and VEH_NOD.** The problems are:





When settings are made there are still errors in the PED_CAJ table.

1. TABLA: PED_CAJ	GENEX-VRP - Data Archivo Edición	ibase Errors /er Análisis Vei 8	Ayuda			Q = 4			- 0 ×
T I II II II I I I I I I I I		Table do							
I he problem lies in the fact that codes	Table	Cod Ped:	Cod Cat	Nuca:	Table	Field	Register Description	Content	Error
of the audious (COD DED) that and	PED_CAI	125244-121	226-121	5	PED_CAJ	COD_PED	1040 Integridad en Campo	7115190-13	101
of the orders (COD PED) that are	PEDIDOS	Browse Tabla		1	PED_CAJ	COD_PED	1041 Integridad en Campo	7115190-13	101
wet listed in the meeter takes this is		Filtrar Registro	s Invalidos	6	PED_CAJ	COD_PED	1042 Integridad en Campo	7115190-13	101
not listed in the master table, this is		Filtrar Registro	s Validos	6	PED_CAJ	COD_PED	1043 Integridad en Campo	7115191-13	101
an under the alteringtion of a day of		Ubicar Registre	o Invalido	3	PED_CAJ	COD_PED	1044 Integridad en Campo	7115191-13	101
caused by the elimination of codes of		126244-121	919-121	1	PED_CAL	COD_PED	1045 Integrade in Campo	7115132-13	101
and any in the ODDEDC TABLE		128647-121	703-121	4	PED CAJ	COD PED	1047 Integridad en Campo	7115203-13	101
orders in the URDERS TABLE .		128647-121	744-121	5	PED_CAJ	COD_PED	1048 Integridad en Campo	7115203-13	101
Colution delete investel accorde		128647-121	760-121	5	PED_CAJ	COD_PED	1049 Integridad en Campo	7115203-13	101
Solution delete invalid records.		128647-121	792-121	5	PED_CAJ	COD_PED	1050 Integridad en Campo	7115203-13	101
		128647-121	823-121	9	PED_CAJ	COD_PED	1051 Integridad en Campo	7115203-13	101
		128647-121	895-121	7	PED_CAJ	COD_PED	1052 Integridad en Campo	7115203-13	101
		128647-121	896-121	7	PED_CAJ	COD_PED	1053 Integridad en Campo	7115203-13	101
Thora are also orders for which there		128647-121	905-121	5	PED_CAJ	COD_PED	1054 Integridad en Campo	7115203-13	101
		128649-121	103-121	8	PED_CAL	COD_PED	1055 Integrad en Campo	7115203-13	101
are no boyos in the table DED CA1		128649-121	225-121	6	PED_CAJ	COD_PED	1057 Integridad en Campo	7115203-13	101
		128649-121	226-121	6	PED_CAJ	COD_PED	1058 Integridad en Campo	7115203-13	101
Colution doloto involid orders and		128649-121	703-121	6	PED_CAJ	COD_PED	1059 Integridad en Campo	7115204-13	101
Solution delete invalid orders and		128649-121	744-121	5	PED_CAJ	COD_PED	1060 Integridad en Campo	7115204-13	101
wature to the applusic of integrity		128649-121	895-121	15	PED_CAJ	COD_PED	1068 Integridad en Campo	96271-110	101
return to the analysis of integrity.		128649-121	902-121	6	PED_CAJ	COD_PED	1069 Integridad en Campo	96271-110	101
, , ,		128649-121	919-121	5	PED_CAJ	COD_PED	1076 Integridad en Campo	99038-40	101
		128650-121	103-121	6	PED_CAJ	COD_PED	0 ID Maestro 36165-121 NO se encuentra en Campo COD_PED	36165-121	701
		128650-121	223-121	6	PED_CAJ	COD_PED	0 ID Maestro 7115136-13 NO se encuentra en Campo COD_PED	7115198-13	701
The image shows invalid records in		128650-121	744.121	0	PED_CAL	COD_PED	0 ID Maestro 7115201-13 NO se encuentra en Campo COD_FED	7115200-13	701
The image shows invalid records in		128650-121	760-121	1	PED CAL	COD PED	0 ID Maestro 7604-59 NO te encuentra en Campo COD PED	7604-69	701
the table PED_CAJ , which will be	Filtra Registros Report	ados como Invalid	os			1		1	05:46:54 p. m.
deleted.	日 クロ	1	22 🌍 😢	XB 🔯 💈	i i 🤅	8	0 🗴 🕸 🕸 🕄 🧮 🛛 🛥 🍕 🖉 🖉	40) 🐠 🖩 🏮 🐺 🛛	ESP 5:46 p.m.





After these adjustments, are new inconsistencies. This shows that to have a database with quality data, is not a trivial task. In the following, the tutorial does not present in detail processes made up to have an integrity error-free database. Correction methodology is presented it so far.

Now that you have an error-free database you can proceed to make the model runs. It should be noted that:

- A system with integrity errors can produce correct solutions
- A system without integrity errors can produce incorrect solutions

The real gain is that when it has been verified the integrity of the information the modeler and functional user are aware of the quality of the data that are handling.





nalyt

CHECKING THE QUALITY OF DATA OF THE IDIS CHECKING DATA INTEGRITY

Once you have the correct data in the IDIS (tables in DBF format), it is possible to export it to an EXCEL template or to CSV files; this can be performed from various points in OPTEX, the following picture is the access to the process from the table of Data Tables.

ata Table	Spanish Descrip	Gen Window	Tranfer DM	Data Model	Icon	Type	Area	Table Generator	Directory	DSN	Key DSN	User DS
\S	Maestra Cajas	.F.	.F.	.F.		M	1					
CAJ	Escenarios Cajas	.F.	.F.	.F.		S	1					
NOD	Escenarios Nodo	.F.	.F.	.F.		S	I.					
PED	Escenarios Pedido	.F.	.F.	.F.		S	I.					
VEH	Escenarios Vehículos	.F.	.F.	.F.		S	I.					
NOD	Nodos <-> Nodos	.F.	.F.	.F.		S	I.					
S	Maestra Nodos	.F.	.F.	.F.		М	1					
VEH	Nodo Origen <-> Vehículos	.F.	.F.	.F.		S	1					
:AJ	Pedidos <-> Cajas	.F.	.F.	. F .		S	I.					
OS.	Maestra Pedidos	.F.	.F.	.F.		М	I I	,				
IOD	Vehículos <-> Nodos	.F.	.F.	.F.		S	1			_		
								El El Gr	rear tabla liminar Tabla (DBF o SQL) liminar Todas las Tablas (DBF o SQL) ienerar Tablas Dependientes rocesar Tablas			
								ln Er	nportar Estructura Tabla DBF ncriptar Claves Primarias			
								G	ienerar Documentos RTF	>		
					Tablas DBF o SQL			C	rear/Recrear/Exportar Tablas del Mod	elo de Datos >		
					Tablas OPTEX-EX	CEL-XI	ML	C	rear Tablas Vacias	>		
					Tablas Libro OPTE Tablas CSV	EX-EX(JEL-XN	Ex	xportar a Sistema de Informacion Geo	grafica		
				_		-		C	hequeo Integridad Referencial - Tranf	erencias Tablas >		
								In	nportar Tablas	>		
		1	1	1	1	1	1 1	C	rear Index SOL			1



"the computer-based mathematical modeling is the greatest invention of all times"

Herbert Simon First Winner of Nobel Prize in Economics (1978)

"for his pioneering research into the decision-making process within economic organizations"