

Technical specification on development
of a fuel card management and
accounting system
“PETROL CARD”

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INTRODUCTION AND SCOPE

This document is intended to briefly cover a basic idea, operation algorithm and technical means for a developed fuel card management and accounting system “PETROL CARD”.

At the step of development it is believed that the developed fuel card system will operate according to described, but as during the development process vision of the project may partly be changed (technical side or operation procedures), so this document may have respective future changes, which will be indicated in subsequent versions of given technical specification.

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LIST OF ABBREVIATIONS

BOS – bank of settlements
DB – database
DBMS – database management system
FC – fuel card
FCMAS – fuel card management and accounting system
MFC - company manager on fuel cards
MOS - company manager on Online-support
MOST – company manager on service of payment terminals
PC – processing center
PS – petrol station
PS network – privately owned network of petrol stations
PT – payment terminal for application of fuel cards
TC – transportation company

GENERAL DESCRIPTION OF A DEVELOPED FUEL CARD SYSTEM

1. BRIEF APPOINTMENT OF THE FUEL CARD SYSTEM

Fuel card management and accounting system (FCMAS) – is a specialized hardware-software complex, which is intended for automation of account, management, reporting, analysis and statistics of sales of products and services in trading networks with payments made using specialized fuel cards. FCMAS works in ONLINE mode of operation: all logic and data are stored only of server of the system.

FCMAS works separately from a system of bank settlements and accounting.

Fuel cards of the system are used by customers. Each card serves as an identifier of customer's account in FCMAS. Each customer account represents a wallet with points stored in it. These points are purchased by the customer prior to a possibility to use the fuel card as a payment mean.

Aim of the FCMAS is to give a possibility to companies that have employees driving cars (vehicles) to replace current way of providing fuel for employees (in a form of coupons, issued by petrol stations) with a more reliable, efficient and economizing tool (in a form of fuel cards). In such a way primary customers for the FCMAS are such companies (hereinafter referred to as transportation companies - TC). Benefits received from usage of the FCMAS by TC compared with coupons are the following:

- Possibility to usage of a fuel card to fill with fuel only by employees personally (not their friends, relatives, etc),
- Possibility to view detailed report on fuel fillings made on each of the employees (filled fuel amount, place of filling)
- Possibility to view detailed report on a places of fillings made by employees and thus receive a geography of employee locations
- Possibility to flexible and most efficient management over fuel cards accounts of employees: rationally distribute points between all employees accounts
- Possibility to set limits on amount of filled fuel per day, week, month, etc
- Possibility to lead management over each employee fuel cards accounts from office
- Optional possibility to control spending of fuel only by employees only on their personal vehicles (with specified vehicle number, lead control over odometer values, etc)

From other side petrol station networks (PS networks), which will use FCMAS, will also receive significant benefits compared to currently used coupons for mutual settlement with TC. Such benefits are the following:

- Possibility to receive detailed reports on usage of fuel cards at their petrol stations (view every single fuel filling made, its volume, cost, time, etc)
- Possibility to have much more customers on their existing petrol stations due to a popularity of the FCMAS
- Possibility to lead precise settlements for filled fuel, which is based on precise electronic reports
- Possibility to be promoted to new customers of petrol stations

For application of a FCMAS at petrol stations they will be equipped with special payment terminals for processing of fuel cards.

Operation and functioning of the system will be provided by a company, which will serve as a layer between TC and PS networks, providing both these parties with a precise reporting information and

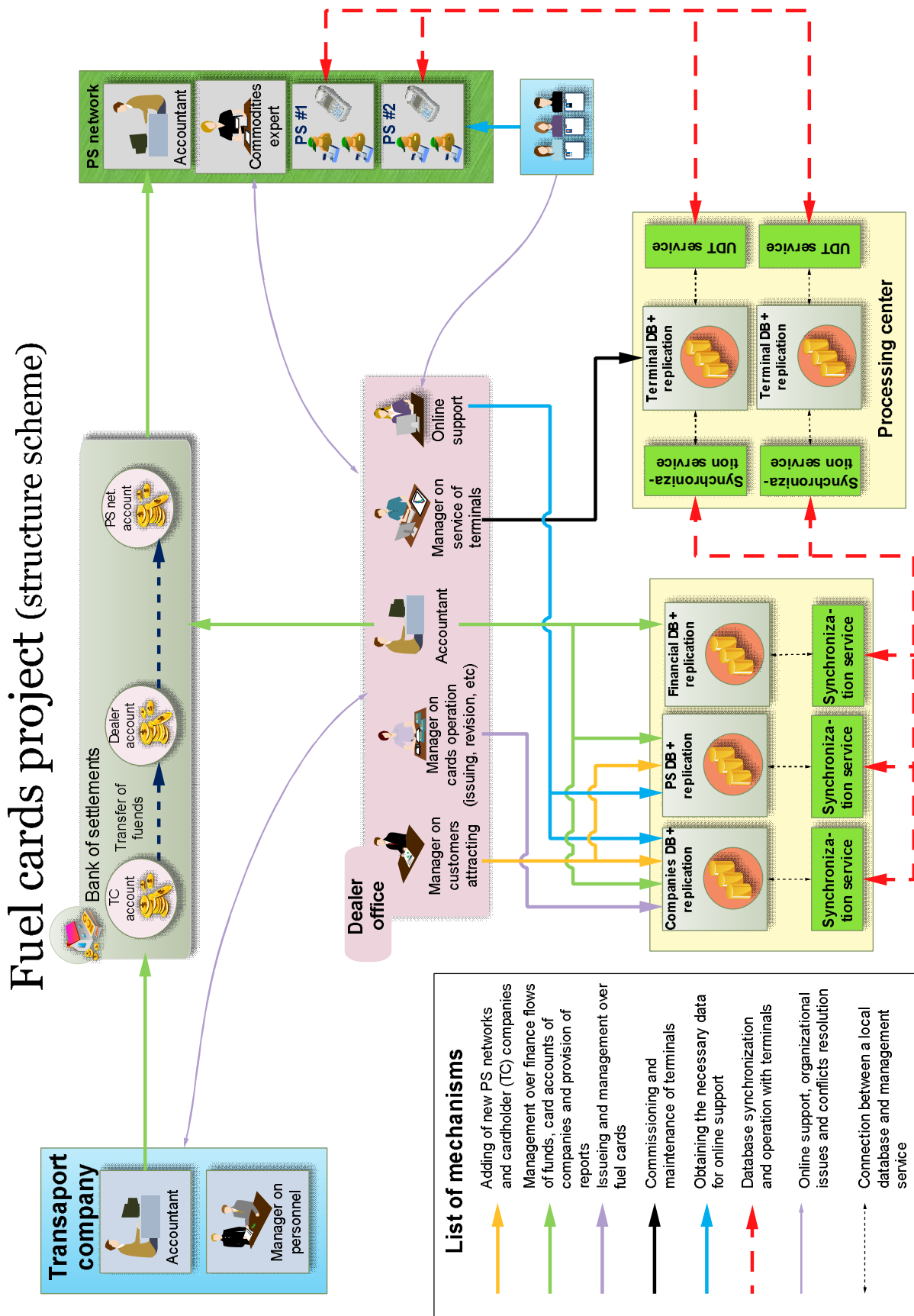
keeping on correct system operation. company will also act as a layer in commercial settlements between TC companies and PS networks, taking its license fees for system operation.

2. PARTIES, WHICH PARTICIPATE IN THE FUEL CARD SYSTEM

Initially FCMAS is developed to cover three main parties:

1. Companies, which give their employees fuel cards in order for employees to refill their vehicles with fuel (hereinafter referred to as TC – transportation companies)
2. Privately owned networks of petrol stations (PS networks), which allow application of fuel cards (FCs) at their petrol stations (payment for dispensed fuel using FCs), for this reason PS networks have a PT installed at their petrol station (PS).
3. Company, which provides functioning and management of FCMAS, control over its correct operation, all required reporting information to TCs and PS networks.

3. STRUCTURE SCHEME OF THE FUEL CARD SYSTEM



4. INTERACTION BETWEEN PARTIES IN THE FUEL CARD SYSTEM

Company serves as a heart of the system, providing its correct operation and controlling money funds movements in the system:

- TC pay for refilling of their employees fuel cards and this money in a view of points are placed on employees fuel cards accounts, which make it possible to use these fuel cards
- Owners of PS networks dispense fuel at payment by fuel cards by TC employees and for this receive their money for dispensed fuel on regular basis (daily, weekly, monthly)

FCMAS provides TC companies to have a possibility in any moment to receive detailed reports on their employees' fuel cards accounts.

FCMAS also provides TC companies to have a possibility to lead flexible and most efficient management over fuel cards accounts of employees. Managers of TC companies can rationally distribute points between all employees' accounts. For coming accounting period (month or another) managers order from company new points to be added to fuel cards account of their employees.

Algorithm of refilling of fuel cards accounts of TC companies

1. Accountant or manager of TC logs in a web-site via a browser and creates a new order for refilling of card accounts of employees (cardholders);
2. Accountant of TC performs request on adding of new points on cardholders accounts, in the end of this operation accountant of TC receives a total cost for all points to be added to all employees card accounts, information about this is automatically sent to accountant and to a processing center;
3. In DB of TCs a new entry is created with a new order number and for a given order processing center generates an invoice with a number and total cost of the new order, which after being accepted by accountant of is sent to TC accountant (manager) or is rejected by accountant;
4. Accountant of TC in accordance with a received invoice performs payment of the invoice in the bank of settlements (BOS) to account a total cost of new order (or sends a notification to accountant of company about a possibility to receive a credit);
5. Accountant of receives a notification from a BOS about reception of payment to account from TC in accordance with an issued invoice;
6. Accountant of allows new points to be added to cardholders' accounts of TC in accordance with a new order.

FCMAS provides PS networks to have a possibility in any moment to receive detailed reports on dispensing of fuel to all cardholders of the system at their petrol stations. Mutual settlements with PS networks are done on regular in advance agreed basis. in a form of license fees takes several Halalas from each sold by a fuel card liters of fuel.

Algorithm of payment for sold fuel using fuel cards to PS networks

1. Accountant of company in accordance with generated reports on realization of fuel on PS networks using fuel cards (reports take into account a size of interest from 1 liter of fuel sold) performs transfer of money funds to accounts of PS networks on regular in advance agreed basis.

The system optionally foresees also a possibility to receive license fees from TC for provision of a service for them and also from PS networks for servicing of payment terminals (PT).

Algorithm of reception of license fees for services

1. Accountant of company receives a notification from the bank of settlements (BOS) about reception to account money funds from TCs as license fees for servicing and maintenance of TC's FCs
2. Accountant of company receives a notification from the bank of settlements (BOS) about reception to account money funds from PS networks as license fees for servicing of PTs

PS networks can not manually change information about prices of fuel at their petrol stations, or types of fuel available. This information can be changed only by a responsible manager of company upon a request, received from a PS network.

Algorithm of management over a products DB of a PS network

1. Upon a request of a products managers of a PS network accountant should edit (modify) products DB of a PS network (structure, prices, etc)

Due to a reason that various PS networks will agree on various value of commission (interest) from each fuel liter sold – the system should automatically calculate PS network profit and commission on each of the PS networks from usage of fuel cards. For this reason all concluded agreements with PS networks should be stored in the system.

Algorithm of concluding of agreements

1. Search of interested PS networks and TC
2. Concluding of agreements for provision of services
3. Inputting of concluded agreements in financial DB

STRUCTURE OF TECHNICAL MEANS OF A DEVELOPED FUEL CARD SYSTEM

1. GENERAL DESCRIPTION OF INSTALLED EQUIPMENT (HARDWARE)

FCMAS for operation uses the following equipment:

At petrol stations

- payment terminals (PTs) installed at petrol stations using which sales of fuel using fuel cards is performed. Terminals are equipped with readers of plastic RFID cards, receipts printers, GSM/GPRS modems, optionally – with barcode scanners;
- fuel cards of operators - plastic RFID cards;
- USB tokens for managers and owners for access to web-server;

At TCs offices

- fuel cards of customers - plastic RFID cards;
- USB tokens for access to web-server;

At office

- personal computers with access to Internet;
- uninterruptible power supply units;
- fuel cards of managers (plastic RFID cards) for payment terminals servicing and issuing;
- USB tokens for access to web-server;
- card-readers for issuing of new fuel cards or updating old ones;

At data center (hosting)

- 2 dedicated servers with Internet connection (main and reserve);

2. SPECIFICATION OF A PAYMENT TERMINAL FOR PETROL STATIONS

Purpose of payment terminal

Payment terminal is to be used at petrol station to provide a possibility to work with customer's fuel cards, communicate with processing center and print receipts on operation.

Payment terminal – is a hardware-software complex of data input/output and exchange with a processing center. Terminal is intended for mobile exploitation at points of sales. Terminal has a built-in accumulator. Terminal has a built-in thermal printer for print-out of confirmation receipts (receipts on transactions). Payment terminal has a built-in GSM/GPRS modem for provision of wireless connection to a processing center through Internet using GSM connection and application of GPRS packet data exchange. IP address of a PC is firmly programmed in the PT at installation and can be changed during exploitation. Terminal is equipped with a reader of RFID cards.

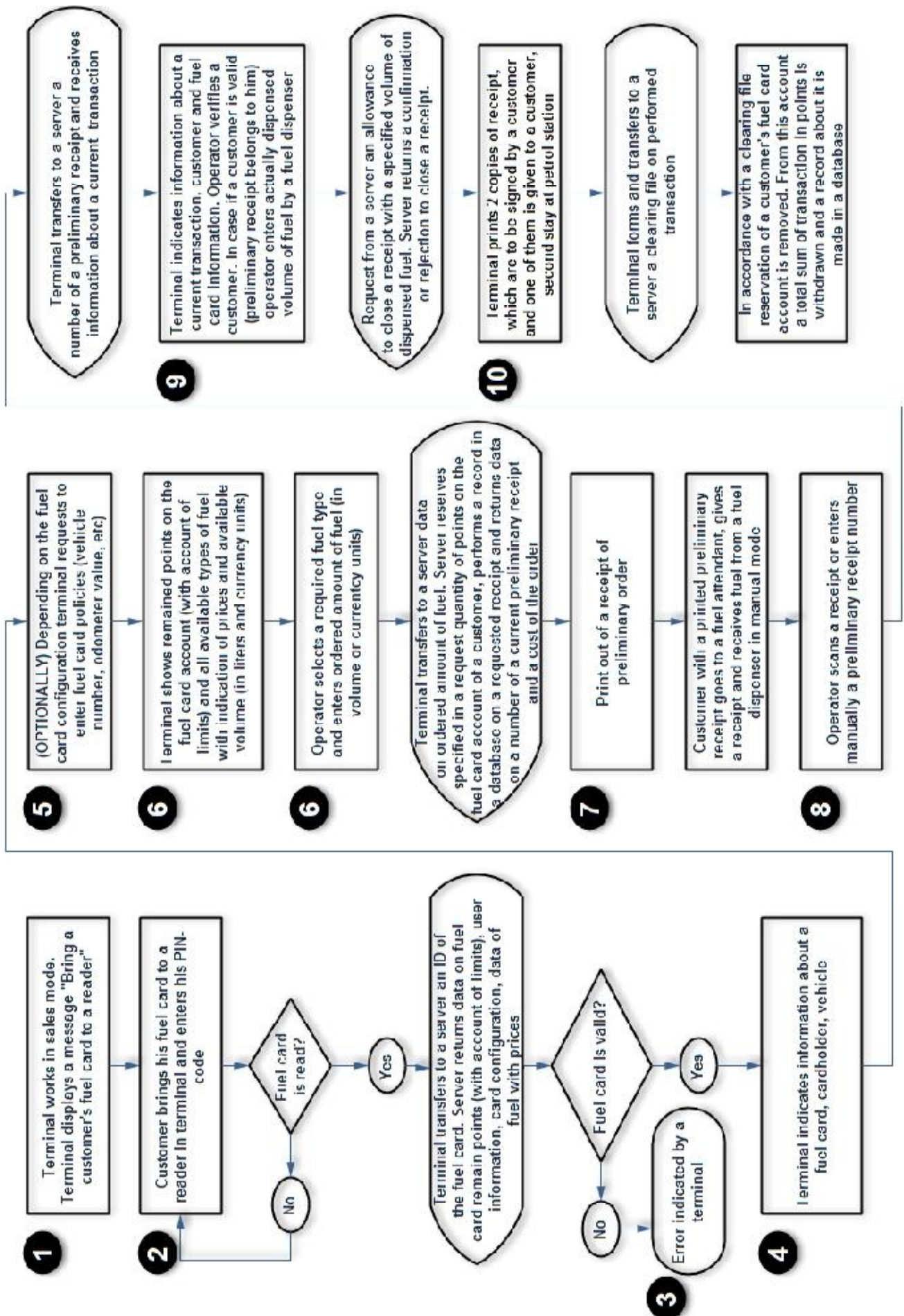
Selection criterias of the payment terminal

1. Terminal should be portable for easiness of carrying of the terminal through the territory of petrol station (in hands, on neck, on belt, etc)
2. Terminal should be protected from dust, water drops
3. Terminal should provide a long operation at feeding from built-in accumulator
4. Terminal's accumulator should have enough capacity to provide feeding of the terminal during at least 5 hours
5. Accumulator of the terminal should be changeable
6. Terminal should be stable for fallings and vibration
7. Terminal should have easily understandable user interface
8. Terminal should have a quite big screen comfortable to read messages
9. Terminal should have a built-in reader of RFID cards
10. Terminal should have a built-in GSM/GPRS modem with double SIM-cards inserted (reservation of mobile operator)
11. Terminal should have a receipts printer with easily replaceable paper rolls
12. Terminal should optionally have a built-in barcodes scanner
13. Terminal should have a possibility of being converted to a control system for future applications (quite big screen, technical specification)
14. Software of the terminal should be run on a operating system for being easily replaceable by another type of terminal in case of necessity (stoppage of manufacture of given terminal, too expensive cost, etc)

Operation of the payment terminal

In normal operation the payment terminal is brought by an operator of the petrol station with him through the territory of petrol station while servicing the customers. In free time the terminal is to be recharged from a power source.

Algorithm of payment terminal operation at serving a customer



Screens of the payment terminal (in accordance with the algorithm of operation at serving a customer)

1

Bring a customer's fuel card to a reader

Turn off

2

Fuel card #: 1234567890

PIN code: XXXX

Back Next

3

Fuel card is invalid. Please address to ...

Main menu

4

Fuel card #: 1234567890

Cardholder: Mohammed Khan

Vehicle #: AA3045BB

Back Next

5

Vehicle #: AA3450BB

Odometer value: 123456

.....

Back Next

6

Remained points: 300

Select a fuel type:

Type	Price	Kiyals	Ltrs
91	0.36	100.00	833.33
95	0.39	300.00	765.23
95	0.43	300.00	697.67
Diesel	0.34	300.00	882.35

Back Next

7

Preliminary receipt #: 10234566

PS #102, Riyadh, 3rd str., 10

Cardholder: Mohammed Khan

Fuel card #: 1234567890

Vehicle #: AA3450BB

ORDER: 91 type on 100 Riyals

8

preliminary receipt #: 10234566

Back Next

9

Fuel card #: 1234567890

Cardholder: Mohammed Khan

Vehicle #: AA3045BB

Fuel type: 91

Ordered doze, Riyals: 100

Dispensed doze, Riyals: 102

Back Next

10

Receipt #: 34225

PS #102, Riyadh, 3rd str., 10

Cardholder: Mohammed Khan

Fuel card #: 1234567890

Vehicle #: AA3450BB

ORDER: 91 type on 102 Riyals

3. SPECIFICATION OF FUEL CARDS

Purpose of fuel cards

Fuel cards are to be used by customers of the FCMAS for payment for filled fuel as unique identifiers of customers. Additionally fuel cards will serve as unique identifiers of payment terminals operators (for sales using terminal) and technical managers (for service operations with terminals).

Selection of fuel cards type

Though all possible card technologies used nowadays (magnetic cards, contact cards, contactless cards) taking into account that FCMAS system operates in ONLINE mode (card serves only as identifier) exactly an RFID technology was selected due to its advantages.

Radio-frequency identification (RFID) is a technology that uses radio waves to transfer data from an electronic tag, called RFID tag or label, attached to an object, through a reader for the purpose of identifying the object.

Advantages of RFID technology:

- Long durability (for years) of cards due to absence of mechanical aging (contactless)
- The card is fast to use (no necessity to insert it – only bring close to the payment terminal)
- The contactless cards use highly secure data transmission standards
- Low cost

Contactless card – is a type of smart-cards, which supports a technology of radiofrequency identification RFID. Generally such model consists from 2 nodes. First – a chip for storage and processing of information. Second – aerial, which is intended for transmitting and receiving of signals. Together these 2 nodes form a RFID-label. In given project a contactless card is used as a mean of identification of customers for organization of turnover on provision of services in a trading network.

4. SPECIFICATION OF PROCESSING CENTER

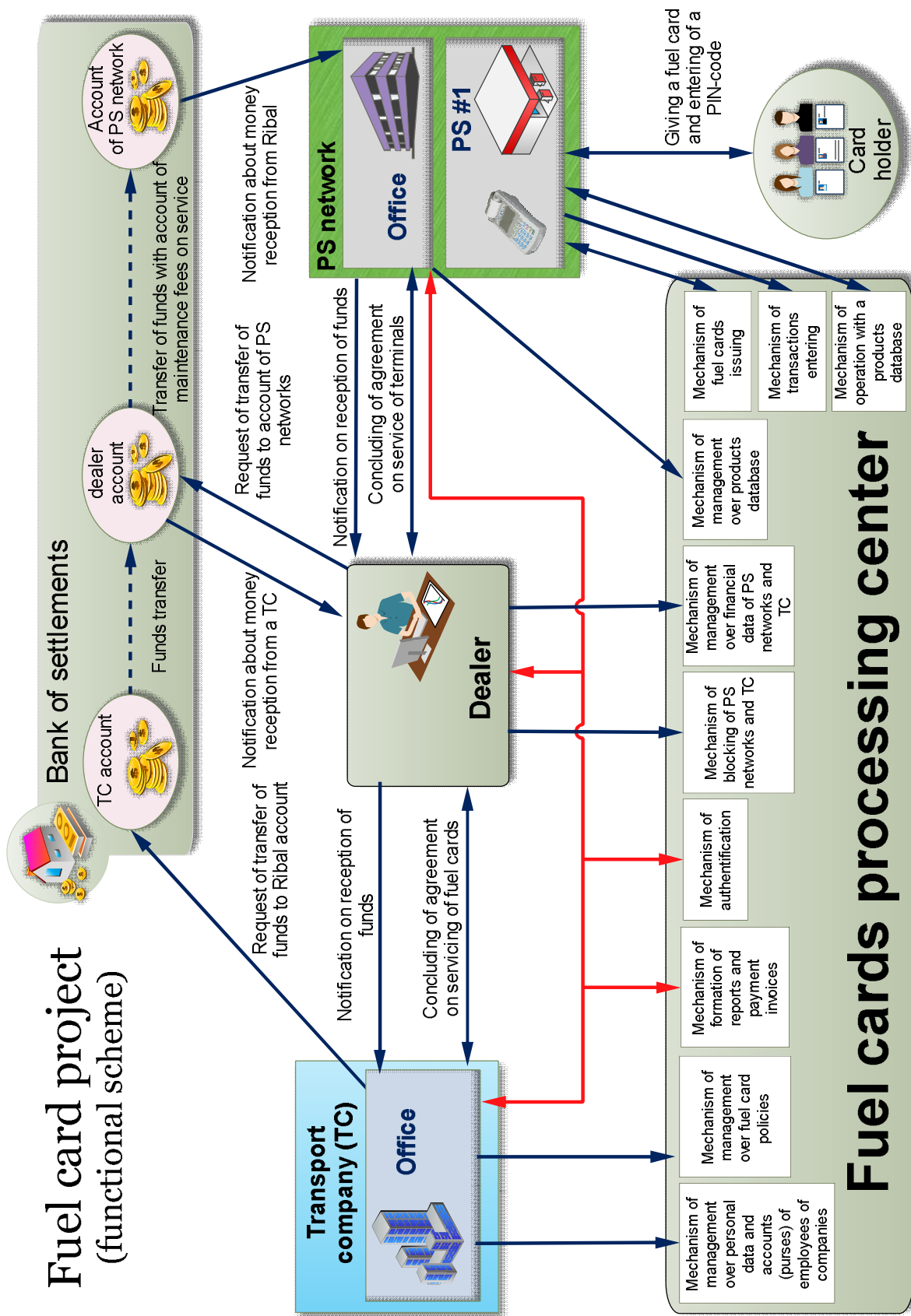
Purpose of the processing center

Processing center is used for operation of the FCMAS: provides all mechanisms, services and databases. Additionally it contains a web-server, using which users of the system receive access to their personal data in the system.

All software of processing center is installed on a dedicated server in data center (hosting). Placing of processing center software in a data center has its advantages that employees of the data center all the time monitor for correct operation of the server (hardware and software) and its environment (temperature, humidity), bear responsibility for all hardware issues. All data in the server is duplicated. Access to a remote server is made remotely via a remote desktop RDP.

Web-server is installed on the same server as processing center software. Access to processing center software can be made only via a web-server (for security reasons).

Processing center mechanisms



Databases of a processing center and their structure

Database management system (DBMS) is necessary for leading of account, control, reports, analysis and statistics of fuel sales.

FCMAS is based of usage of DBMS MySQL due to its following features:

- MySQL is widely applied in various projects all over the world
- MySQL is a free DBMS

Database of a processing center are divided into 5 separate databases in order of highering of security of the system. Each database has its own separate authentication thus even if a hacker somehow receives access to 1 database – he will not be able to use this to access to another database. Synchronization between databases is made using synchronization services.

Database (DB) of transportation companies (TSs): cards, employees, ..

- List of registered cardholders
- List of cards
- List of cards wallets
- List of cardholders
- List of vehicles
- List of cards configurations
- List of types of cards statuses

DB of PS networks

- List of PTs
- List of operators of PSs and personal data
- List of PS networks
- List of regions
- List of PSs
- List of products on each PS with prices
- List of types of product groups
- List of units of measurements of product groups

Financial DB

- List of invoices
- List of agreements
- List of documentation

DB of TCs

- List of PTs
- List of PT firmware versions
- List of PT configuration information

DB of transactions (is included into a structure of a PC)

- List of every transaction in binary (logging of received binary on transaction by UDT-server)
- List of event of PTs (logs of terminals)
- List of files for terminals
- Table with reports on execution of files by PTs
- Table with logs on actions of all operators
- Table for creating of files for terminals
- Table with receipts of PTs
- Table with data of cards configuration (is filled at sales using cards: odometer value, vehicle number, etc);
- Table with transactions
- List of registered managers of TCs, PS networks, managers
- List of registered UDT-servers
- List with data structures of UDT server protocol
- List of shifts (general for all DBs)
- List with types of all access;
- List with types of all binary files
- List with types of all receipts statuses
- List with types of errors
- List with types of events
- List with types of files
- List with types of reports on files
- List with types of statuses of files
- List with types of logs
- List with types of logs statuses
- List with types of access levels
- List with active managers

5. SPECIFICATION OF A WEB-SERVER

WEB server provides interface between a processing center of FCMAS and its users. WEB server serves for covering of all needs of all parties of the project. Web-server is based on ASP.NET technology from Microsoft Corporation due to its advantages:

- Reliability of the technology
- Millions of applications in the world (including the most complex web-solution)
- Simplicity and speed of development
- Free tools for development
- Cheapness of hosting

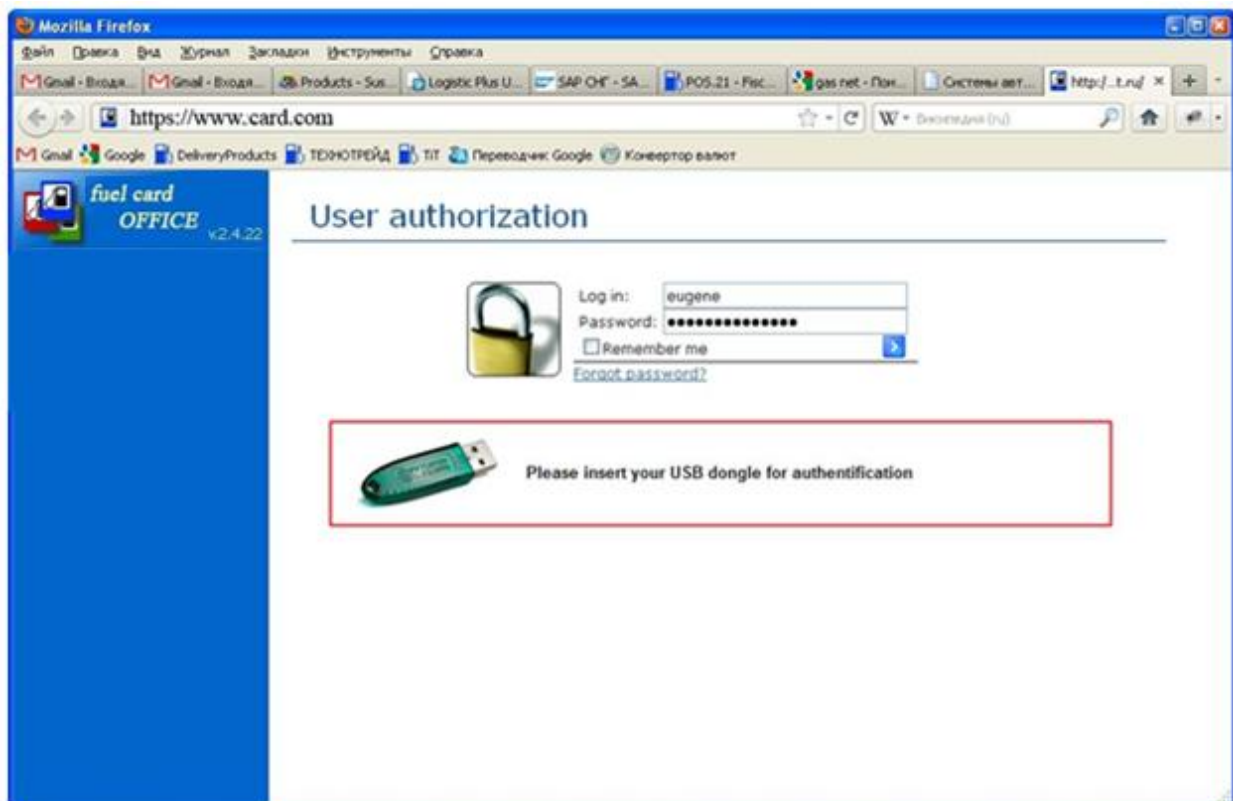
For a FCMAS a web-server will be installed on a server of a processing center. A respectable domain name will be used to access it (example: PETROL-CARD.COM).

Web-server will cover all sides of FCMAS operation for all parties in the project.

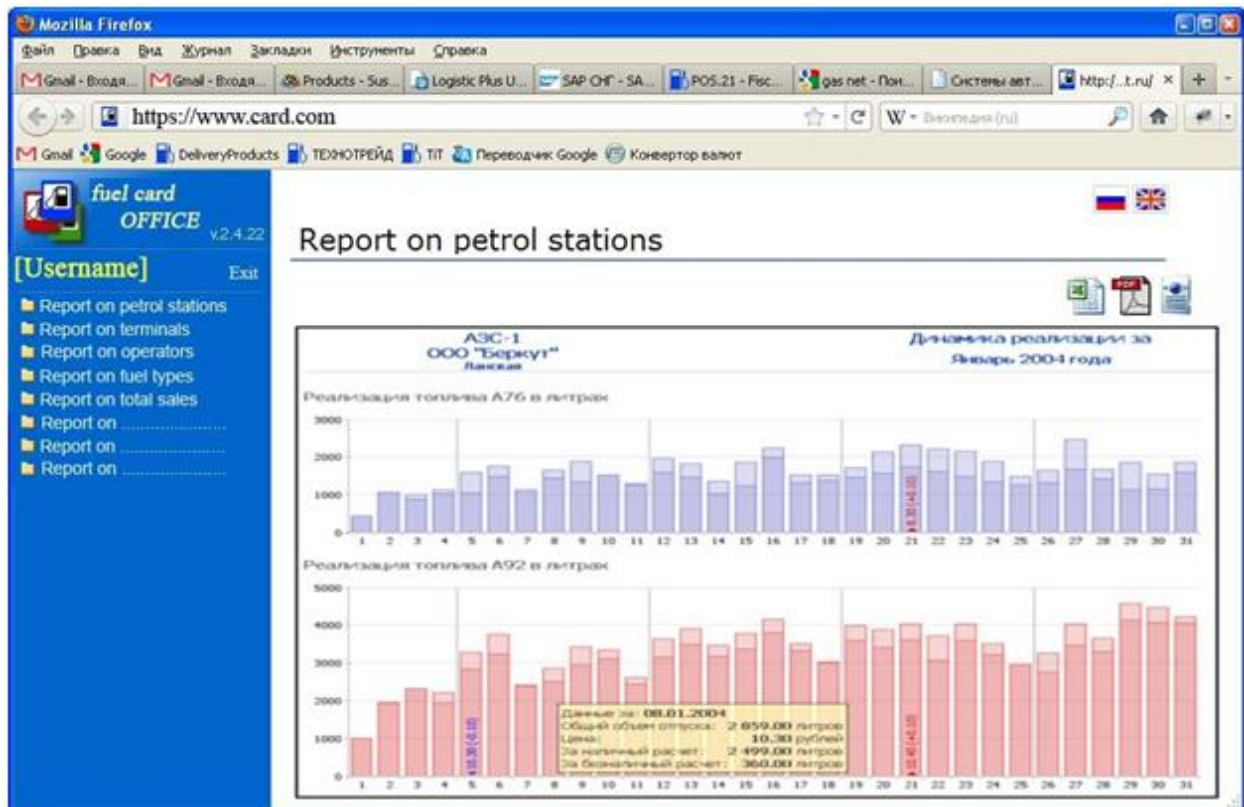
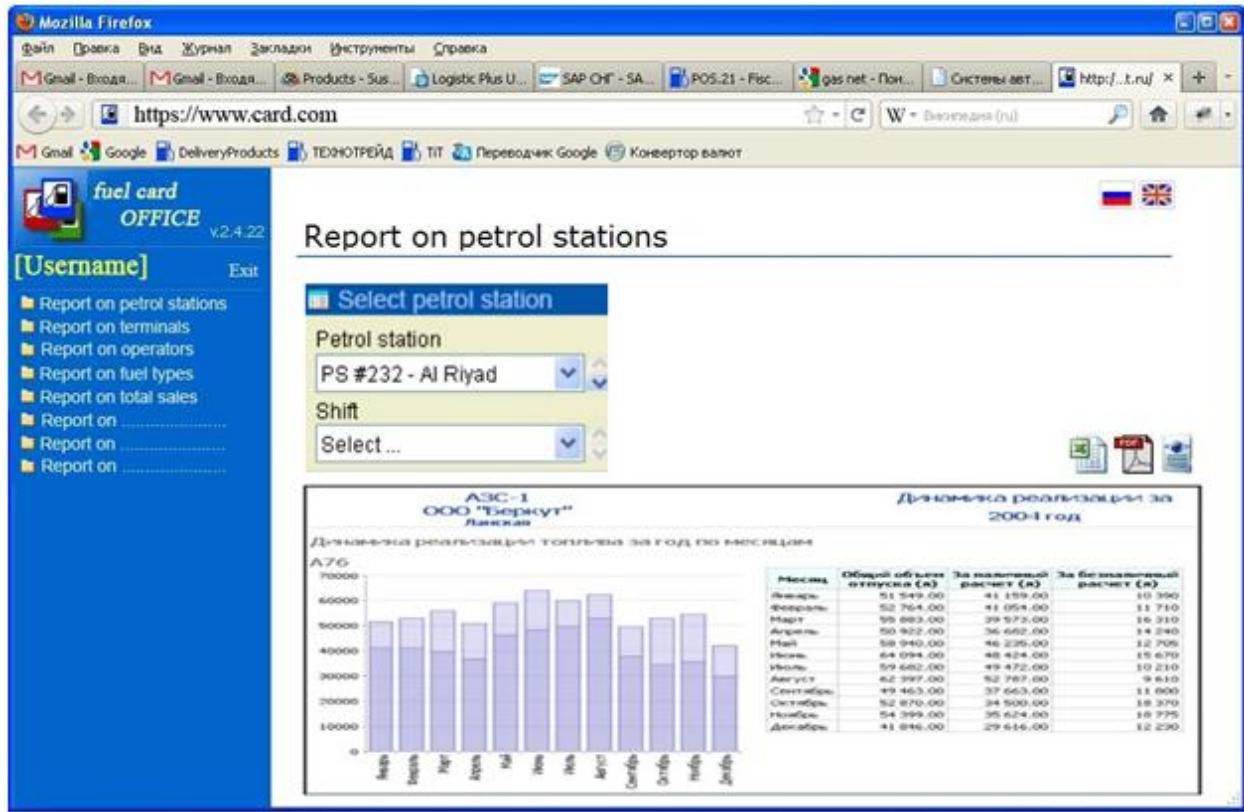
User authorization

User authorization page is common for all users. Determination of a user is done based on its login/password and USB dongle ID.

- Single separate WEB-site with a requested domain name
- Trusted certificate (VeriSign, Thawte, Go Daddy)
- SSL-encryption security of transferred information
- requirement to use personal USB dongle
- automatic detection of user (manager, PS manager, TC manager) and its permissions



Reception of reports via a web-server (on example of petrol stations users)



Possibilities for PS networks using a web-server

FCMAS provides PS networks to have a possibility in any moment to receive detailed reports on dispensing of fuel to all cardholders of the system at their petrol stations.

- possibility to select various reports (depending on the tasks)
- possibility to receive reports by a name/number of a petrol station
- possibility to receive reports by a session number
- possibility to view reports in a form of a table
- possibility to view various graphical diagrams according to the table data
- possibility to export table data to various sources (for example Excel, XML, PDF)

Example of a report for a PS network

Fuel spending Monthly Sub-Report- Terminal# xxx1 - Petrol Station# XXXX

Month		Year			
PS name		Terminal code	XXX	PS address	
PS code	XXX	City code		PS- Quantity of terminals	
				PS Tel. No.	

Terminal Code	Card Mem.No	Points quantity spent	Fuel type	Fuel quantity	Petrol station charge	invoice No	Operation number	Date	Time
XXXX	xxxx xx xxxx xxxx	ZZZ.YY	ZZZ.YY	xxx.xxxxx	xx.xxxxxxxx	XXXXXXXXXX	xxxx xxxx xxxxx	XX-YY-ZZZZ	XX:YY ZZ

Example

Terminal Code	Card Mem.No	Points quantity spent	Fuel type	Fuel quantity (L)	Petrol station charge (Riyal)	invoice No	Operation number	Date	Time
2311	5542 21 4452 3215	32.00	91	71.111111	30.57777778	2112200121	10001	19/03/2011	20:22
2311	5323 21 3321 2221	18.00	95	30.000000	17.4	1121122654	10014	20/03/2011	08:12
2311	5212 21 4452 5524	15.00	Dies	50.000000	14	2112200122	10044	22/03/2011	11:12
2311	6223 21 3321 5223	35.00	91	77.777778	33.44444444	1121122687	10098	22/03/2011	09:12
2311	1102 21 4452 5211	12.00	91	26.666667	11.46666667	2112200121	10015	24/03/2011	20:55
2311	6223 21 3321 1121	19.00	95	31.666667	18.36666667	1121121120	10115	25/03/2011	10:12
Total		131.00		287.222222	125.255556				

Total Spending points	131.00	Points
Total spending fuel liters	287.222222	Liters
Total PS# charge	125.255556	Saudi Riyal

- Terminal Code : code of the terminal operated on the mentioned petrol station
- Card Mem.No : the membership number of the card which used to pay against purchasing fuel
- Points quantity spent : the amount of points deducted from the card for each operation

Possibilities for TC companies using a web-server

FCMAS provides TC companies to have a possibility in any moment to receive detailed reports on dispensing of fuel to all employees of their company - cardholders of the system at petrol stations. FCMAS also provides TC companies to have a possibility to lead flexible and most efficient management over fuel cards accounts of employees. Managers of TC companies can rationally distribute points between all employees' accounts. For coming accounting period (month or another) managers order from company new points to be added to fuel cards account of their employees.

Example of a report for a TC company

Petrol Spending monthly report - Card No. xxxxxxxxxxxxxxxxxxxx										
Month	March	Year	2011	PS Code	xxxx	City code				
Cardholder	Jone zoiel	Company	Sabbec	Company Code	xxxx					
Card No.	xxxxxxxxxxxxxxxxxxxx	activation date	21/03/2011							
Car Model	GMC Envoy	Car year Made	2002	Plate No.	1102	Car odometer value time of activation	51200 km			

#	PS name	PS Location	Fuel liters filled (liters)	Type of fuel	Amount spent(Riyal)	Car plate Number	Car Kilometrage	Date	Time	odometer value different	avarage kilometer Per Litter
1	D\$ PS	X Sstreet , Y \$area , Z \$city	X	91	X	X	X	XX-YY-ZZZZ	XX:YY PM	X	X
2	F\$ PS	X Sstreet , Y \$area , Z \$city	Y	95	Y	Y	Y	XX-YY-ZZZZ	XX:YYAM	Y	Y
3	G\$ PS	X Sstreet , Y \$area , Z \$city	Z	desel	z	Z	Z	XX-YY-ZZZZ	XX:YYAM	Z	Z

Example

#	PS name	PS Location	Fuel liters filled (liters)	Type of fuel	Amount spent(Riyal)	Car plate Number	Car Kilometrage	Date	Time	odometer value different	avarage liter Per Km
1	Alhokil PS	PLE st. , Zohor , Alkhobar	40	91	18	1102	51200	16/03/2011	03:22PM	0	0
2	Alsahel PS	Mansor st, Aqrabia , Alkhobar	51	91	22.95	1102	51340	18/03/2011	10:45AM	140	3.5
3	Alsobar PS	1st st ,alshatee , Dammam	45	91	20.25	1102	51530	19/03/2011	11:30AM	190	3.73

- PS name & location: Petrol station name & location , on the same time we'll give each PS under our network a codedepend on the city
- Fuel liters filled (liters) : the quantity of litters filled by the cardholder in each ductting operation
- Type of fuel : specefiying the type of fuel depending on its ocatne or if it is desel fuel
- amount spent is the oint which deducted against the value of fuel litter filled in each operation
- Car plate number : the car which will fill the fuel every time need to enter its plat four number
- Car odometer value : enetrig the value of the car odometer on the time of filling fuel on each operation

6. SPECIFICATION OF OFFICE

Equipment installed in office for employees

Basically all required equipment for office will include:

- personal computers with access to Internet;
- uninterruptible power supply units for personal computers;
- fuel cards of managers (plastic RFID cards) for payment terminals servicing and issuing;
- USB tokens for access to web-server;
- card-readers for issuing of new fuel cards or updating old ones;

Possibilities for company using a web-server

FCMAS provides company managers to have a possibility in any moment to receive detailed reports on operation of the system in all details and provide administration over the system.

Reports for company

- report on actions of managers on working places;
- report on cardholders;
- report on TC companies;
- report on PS networks;
- financial reports;
- reports on analysis and statistics

Organization of workplaces in office

Manager on fuel cards (MFC):

- adds to a DB of TCs new customer FCs
- adds to DB of PS networks new cards for operators
- changes statuses of FCs (activated, blocked, unblocked, etc)
- forms accounting documents of FCs

MFC is responsible for operation of the fuel cards.

Issuing and account of FCs

1. MFC receives from a typography made ready cards with embossed personal and company information
2. MFC adds to a DB of TCs new cards with following information:
 - identification number of a TC (owner of a FC)
 - configuration of a FC (requirement to input a vehicle number, indications of odometer, etc)
 - identification number of a FC
 - RFID identifier of a FC
 - personal data of a cardholder
 - information on a vehicle
 - serial number of a FC (printed on a FC);

- MD5-hash of a PIN-code;
 - FC status («not active»);
 - data on quantity, types and limits on wallets
 - personal identifier of manager, who made issuing of a FC
 - date and time of operation
 - comments to a FC
3. MFC adds to a DB of PS new FCs with a following data:
- identifier of a PS – owner of a FC
 - identification number of a FC
 - personal data of a cardholder
 - RFID identifier of a FC
 - MD5-hash of a PIN-code;
 - FC status («not active»)
 - personal identifier of manager, who made issuing of a FC
 - date and time of operation
 - comments to a FC
4. MFC gives cards to customers with all necessary documentation (PIN-code, user manual, list of PSs) under a mortgage value.
5. MFC prints-out all required reports on cards.
6. MFC performs editing of any non-financial information on cards upon request of managers on personnel of TCs (changing of PIN-codes, FC statuses, personal data of cardholder, etc).

Reports on FCs

MFC forms required reports on FCs:

1. report on FCs (on cardholders, vehicles, FC statuses)
2. report on actions of cardholder

Manager of servicing of payment terminals (MOST):

- provides maintenance of PTs life cycle (from leading into exploitation will finishing of operation)
- updates firmware versions of PTs (locally and remotely)
- updates configuration inside the PTs (locally and remotely)
- provides diagnostics of PTs (locally and remotely)
- is responsible for repair and replacement of PTs

MOST is responsible for operation of the PTs.

Installation and configuration of the PT

1. MOST receives a new PT
2. MOST programs the PT with a latest version of firmware
3. MOST adds the new PT in a terminal DB with following information:
 - identifier of a PT network
 - identifier of region

- identifier of a PS
 - identifier of PT (unique number of PT)
 - calling number of PT (for service functions)
 - PT firmware version
 - MOST's personal identification number
 - data and time of operation
 - comments to a PT
4. MOST can print-out reports on PTs and perform service of PTs (updating of firmware, updating of configuration, control over a technical state of PT, consultation support).

Activation of PTs

Only qualified administrator of company has a possibility to change values of fields "identifier of PS network", "identifier of region", "identifier of PS", which make link between a PT and PC and thus activating a PT.

MOST forms required reports on PTs:

1. Report on commissioning of PTs
2. Report on updating of firmware versions and configurations of PTs
3. Report on updating statuses of PTs
4. Report on service of PTs

Accountant:

- receives requests from TCs to refill its employees' (cardholders') accounts and issues an invoice to TC
- receives from a bank of settlements (BOS) notifications on performed transfers of money funds;
- refills accounts of TCs to employees (cardholders)
- in accordance with total quantity of points spent by cardholders for reception of fuel at PS transfers money funds to PS accounts with account of maintenance fees on service
- provides management over prices of products lists of PS networks (change prices on fuel upon request of PS products managers)
- inputs to financial DB data on performed agreements with PS networks and TCs:
 - size of interest from 1 liter of fuel sold (for PS networks)
 - size of license fee (for TCs)
 - other information about agreements

Manager on Online-support (MOS):

- receives calls from participants of a fuel card project (FCP)
- performs necessary consultation (with a possibility to attract another manager, in whose competence lies solution of given question)
- performs solving of conflict situations (with a possibility to attract another manager, in whose competence lies solution of given question)

Marketing manager:

- Performs search and attraction of new TCs and PS networks
- Is responsible for marketing and advertisement campaigns
- Organizes and performs presentations

Manager on security:

- performs control over legitimate access to systems and data of fuel card project (FCP)
- controls over all performed transactions using FCs and watches for possible infringements
- controls over all refilling performed with the aim to avoid possible infringements

ORGANIZATION OF SECURITY IN THE FUEL CARD SYSTEM

1. APPOINTMENT OF SECURITY

As the FCMAS is going to deal with financial data of many companies – the system should be very strictly protected from any unauthorized modifications of data in the system or viewing access. With this purpose a number of various preventive means is foreseen.

2. PROTECTION ON THE LEVEL OF RFID FUEL CARDS

1. The contactless cards use highly secure data transmission standards. Contactless cards make use of the most secure encryption standards practical with current technology. 128-bit and triple DES encryption make it nearly impossible for thieves to steal your data.
2. The contactless card never transmits a card number. Instead, the RFID chip within the card creates a unique number for the transaction; if a criminal intercepted the number, it would be useless even if successfully decrypted.

3. PROTECTION OF DATA IN COMMUNICATION CHANNEL BETWEEN THE PAYMENT TERMINAL AND PROCESSING CENTER

Data transmitted between a payment terminal and a processing server is encrypted with algorithms ...

4. PROTECTION OF ACCESS TO DATA IN PROCESSING CENTER

Processing center foresees several means for protection for possible hacking:

1. Access to processing center is possible only from a web-ser using special functions, all other ways (communication ports) are disabled.
2. Database of a processing center are divided into 5 separate databases in order of highering of security of the system. Each database has its own separate authentication thus even if a hacker somehow receives access to 1 database – he will not be able to use this to access to another database. Synchronization between databases is made using synchronization services.
3. All databases have a 3-layer degree of protection

5. PROTECTION OF ACCESS TO DATA IN PROCESSING CENTER

1. Trusted certificate (VeriSign, Thawte, Go Daddy) installed for domain of the web-site, which guarantees that a web-site in original (protection from fishing)
2. SSL-encryption security of transferred information
3. Requirement to use personal USB dongle (protection from fishing)