PHOENIX

COMMERCIAL SOLUTIONS

CEDI- Central Electronic Data Interchange

Executive overview of the Phoenix Commercial Solutions CEDI System solution

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Aim of the CEDI System

To alleviate congestion at the African border posts for commercial vehicles through the use of technology by connecting the various shareholders digitally. The CEDI System will benefit all parties involved.

Solution Introduction

The Tripartite Free Trade Area was officially launched on the 10th of June 2015 and there is now an inherent need for a uniform system to be in place that will cater to the commercial cross border trade needs. The basis of the commercial border crossing procedure is standard throughout most African countries. The policies, however, is where the challenge lies, as they differ from country to country. With the CEDI System in place, not only will it assist in alleviating the congestion at the borders but will also simplify the process to move cargo from one country to another.

The CEDI System Solution is as a digital ecosystem. The aim of which, is to connect a number of communities through the transfer of data. The communities are made up of Border Post Users (Customers with their own in-house logistics department i.e. large multi-national franchises, Logistic companies and Hauliers) and customs of the various countries (Revenue Authority, Agencies and Border Post Officials). Each community will have a portal that will provide certain functions and these portals will be connected to create the digital ecosystem. These functions include digitising the country's current border control processes and policies. The digitisation allows for quick and easy access to information about companies, cargo, drivers, routes, time frames, policy changes and more. This information provides the various authorities with the feedback needed to make informed decisions regarding future development of the country and its borders. With the information accumulated by the CEDI System, the authorities will be able to draw reports to determine:

- The number of commercial vehicles that have crossed over a particular border.
- The type of vehicles that have crossed over in a particular period i.e. Tankers, Flat beds, super links etc.
- Time taken to complete the border crossing.
- The Border Post Official's average time to deal with a border crossing both individually and as a unit. This can also be compared to other border post units servicing that country.
- Type of cargo is entering into and exiting from the country as well as the origin of the said cargo.
- How much of cargo entering the country is destined for that country and how much is in transit.
- The amount of Taxes in terms of duties, environmental, RIT, CVG etc., was paid over a period of time.
- The frequency of which a particular company enters or exits the country.
- The number of vehicles are inspected and the reasons for inspection.
- And more... curb corruption by border officials; eliminating stowaway's and reduces smuggling.

This solution is a living system and as such, it constantly needs to be updated, enhanced and maintained to keep up with the needs that may arise over time.

Assumptions:

- All parties will have reliable internet access (We will create an independent network via satellites above Africa give the rural locations of most of the border posts).
- Agreements will be put in place between the relevant countries that this system will be used to move commercial vehicles through Africa.
- A dedicated lane for commercial vehicles.

Challenges that were considered when constructing the CEDI System Solution

- Determine how to connect the border post users with customs with regards to processes for the relevant borders en-route while keeping within the requirements of their policies.
- Identification of the vehicle at border posts
- Identification of the drivers at border posts
- Verification of the Drivers
- Verification of the Cargo
- Feed back to the client
- Route with Multiple stops and pick ups
- Policies and changes to those policies of a country
- Payments for taxes etc.
- Communication between the two sides of the border post
- Power to the border post
- Tariff disputes
- The CEDI solution and current Electronic Data Interchange (EDI) systems
- Tripartite Free Trade Area

Solutions to these challenges

The solutions to the challenges mentioned above are broken down to below and came from extensive research done by Phoenix Commercial Solutions.

- **Determine how to connect the border post users with customs with regards to processes for the relevant borders en-route while keeping within the requirements of their policies.**

The internet is the tool whereby we will connect the parties involved and to increase the speed of data transfer. We will develop a secure digital ecosystem made up of the various portals that allows all relevant parties to register. Their registration must be approved by an authorised person belonging to a third party still to be determined.

Border Post User - Upon approval of their registration, the border post user will load the company's general information i.e. Registered name of the company, Registration number, VAT Number, Import and Export number, Physical Address, Postal Address, Address of the distribution centre etc. The border post user will also load their up-to-date certifications or verification documents, their Commercial Vehicle Guarantee (CVG) Coupons; Removal in Transit (RIT) permits etc.

The border post user will also load their drivers with all their relevant details i.e. name, ID number, employee number, Drivers licence number, Drivers licence code and palm vein algorithms.

The border post user will also load all their vehicles on the system by model, make, type, registration number, VIN number etc.

Customs - The customs officials that deal with commercial trade will also be registered on the system. They will fill in all their relevant details i.e. Name, position, country, division, contact details etc. Reason for the allocation, is so when the customs official deals with a task they will be identified by their details that have been entered on the system. All the customs documentation will be digitised and grouped by the country and division they represent. This will make it easier for the compilation of reports.

Border control officials at the respective border posts will also be registered on the site with all of their particulars. Again, their details will be allocated to the transaction which they are dealing with, and will be documented whenever they complete a task.

- **Identification of the vehicle at border posts**

To determine the identification of the vehicles at the border post, a unique identification element must be verified, i.e. with vehicles, this is the licence plate. We will use camera's that are paired with Optical Character Recognition software to determine the identification. When the vehicle pulls up to the border post the camera will read the make and registration of the vehicle and send it through the server which will relay the information to the system. The system will link the registration number and make of the vehicle to the company, cargo and driver. This will instantly send all documentation to the border post official for confirmation.

- **Identification of the drivers at border posts**

The identification of the driver will be done with a smart card. The border official will give the driver a device whereby he will insert his smart card. The smart card device will compare the information on the smart card to the palm vein scan and if it matches, then all the drivers' documentation will appear on the border post official's device. In addition, and for security reasons, a camera at the border post will take a snap shot of the cabin. The snapshot will be sent to the system for the record.

- **Verification of the Drivers**

The unique identifiers the system will use for people are their palm veins (the creases on the inside of the hand). The veins in a person's palm are unique and do not change from birth to death. The verification of the drivers will be done with palm vein biometrics. When the driver places one of his hands above the biometric mechanism, the algorithm will be sent to the system. The information on the smart card must match the palm vein algorithm to the driver. Once they have matched up, a picture of the driver and all his relevant documents will appear on the border post official's device.

- **Verification of the Cargo at the border post**

When the vehicle is loaded at the distribution centre and the doors are closed, a custom official and an independent 3rd party will attach an electronic seal to the door. The electronic seal will be tracked

via satellite. If the seal is tampered with for whatever reason, an event will be transmitted to the haulier, logistic company and the border post where the vehicle and cargo will cross. The reason for this is so the vehicle can be inspected by the border post official to curb smuggling.

When the driver gets to the border post, the border post officials will inspect the electronic seals to see if they are still intact. If the electronic seals are still in place, it means that the doors have not been opened and the goods have not been tampered with. The electronic seal will send constant information to the system for record purposes.

- **Feed back to the client**

All the information collected will be compiled and grouped to the particular border post. This information will be kept on the server at the border post and recorded on the system for the Revenue authority and border post user's records.

- **Route with Multiple stops and pick ups**

When a border post user has multiple stops and /or pick-ups, each leg will be treated as one trip. Each trip will have to follow the process from where the vehicle gets loaded again. So therefore, the Road Freight Manifest must be updated and the cargo must be inspected by a Customs department official and / or official 3rd party that will seal the cargo and allocate an electronic seal for that leg of the trip.

- **Policies and changes to those policies of a country**

The CEDI solution is not designed to change the country's entry and/ or exit policies, it does however digitise them. By digitising the policies, it makes them easily accessible to the users of the border post.

It is a natural progression in all policies that change will occur. When they do, the change needs to be communicated to all border post users that may be entering the country. With the CEDI solution, the revenue authority of that country can change a policy from their administration page. When the policy is confirmed, the users of the border posts going in to the country will get the notification of the change of policy.

- **Payments for border crossing**

From our research, we found that payments are the cause of a lot of the delay at the border posts in Africa. Our solution to this is to implement a payment gateway in the CEDI system, where the users can pay the duties on the cargo, Commercial Vehicle Coupons (CVG), Removal in Transit (RIT) permits and any other taxes that may be imposed on them through the CEDI System. The payments are made instantaneously and will be reflected on the documents at the border post for officials to verify.

- **Communication between the two sides of the border post**

One of the challenges that JICA still faces with the One Stop Border Post, which also seems to be an issue with conventional border posts is communication with either side. The challenge arises from cables getting stolen. The solution that JICA suggests is laying optic fibre to connect the two sides

but this will prove to be very expensive and optic fibre is very brittle. As part of the CEDI system, we will build a communication system whereby the two sides can communicate wirelessly with each other through typing an instant message like Skype and all communications will be recorded to be referred back to in the future.

- **Power to the border post**

Power supply in Africa is intermittent at best. The border posts, in particular, need to be powered at all times because if there is no power they cannot function and this will cause delays. At the moment, there are a number of renewable energy options in the market. The best option, in our opinion, is solar.

- **Tariff disputes**

With the development of products, it is inevitable that some tariffs codes might not cover the products in the cargo. Built in the CEDI solution there will be a search bar for tariff codes. This will work with the use of keywords. The Border User will enter a key word and a selection of tariff codes with their description and they can choose the one that fits best. However, should there be no compatible tariff code; the Border Post User can request a tariff code from customs regulating the country of destination. This will be done through the built in Request for Tariff function. This function will allow the Border User to request the tariff code for the product in question by filling in the online request form by entering information in the following fields:

- Full description of the product
- The Uses of the product
- What industries the product is used in
- Motivation

- **The CEDI solution and current Electronic Data Interchange (EDI) systems**

The idea of the CEDI solution is to have one uniformed system that can be used throughout Africa. Some countries such as South Africa have an EDI system in place. These EDI systems can integrate with the CEDI solution. The CEDI solution will be more comprehensive than the EDI systems that are currently in place, so these systems will pull the information needed from the CEDI system.

For the countries that do not have a working EDI in place, the CEDI solution will fulfil that function for them. These countries will be able to draw reports from the CEDI system and it will give them the information needed to grow and develop their country.

- **Tripartite Free Trade Area**

The Tripartite Free Trade Area (TFTA) was launched on 10th of June 2015. The TFTA is comprised of three Regional Economic Communities, namely Southern African Development Community (SADC), East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA). The TFTA covers 26 countries in the southern and eastern parts of the African continent. The area's Gross Domestic Product is estimated at about $1 Trillion dollars.

One of the objectives of the TFTA is to increase the intra-African trade from 7% to at least 25% or more. This will be achieved by making border crossings for commercial vehicles from one country to another as efficient as possible. This is where the CEDI solution comes into play. The goal of the solution is to make all information needed to move cargo from one country to another, available and easy to process for clearance and approval including payments, before the cargo even gets to the border post. This will alleviate any waiting time currently experienced at the border post while everything gets processed by the border post officials. Effectively streamlining the process at the borders and easing the congestion experienced at the borders.

The CEDI solution will be a step forward to realising the African Union's (AU) goal of establishing the African Economic Community (AEC).

Executive overview of the CEDI System Solution Process

Border Post User

As we mentioned above, the CEDI system is a digital ecosystem. That being said, there are three types of registration for the border post user section, namely:

1.) Customer – A customer will need to have their own logistics department i.e. Pick 'n Pay, Shoprite, Builders Warehouse etc. Otherwise they must contact a logistics company.
2.) Logistics Company
3.) Haulier

Each will have their own portal to cater to their individual requirements and will also be connected to each other because these different types of are intrinsically connected.

Customer – Large Multi-National Franchise

The customer will register on the CEDI system with:

- The Company Trading Name
- Head of Logistics Department Name
- Email Address
- Password
- Physical Address
- Postal Address
- Contact Number

Once their registration is approved, they will complete all their relevant information:

- Head Office Country of Origin
- Registration Number
- VAT Number
- Distribution Centre Address
- Customs department import and export number

- Insurer Name
- Policy Number
- Any other information that will be needed

The customer will upload the supporting documents that verify the information that has been entered into the system. Following that, they will register the employees that will be working with the portal and their email addresses i.e. Logistics managers and their staff.

Logistics Company

The logistics company will register on the CEDI system with:

- The Company Trading Name
- Head of Department Name
- Email Address
- Password
- Physical Address
- Postal Address
- Contact Number

Once they are approved, there will be a section where the logistics company will be able to fill in their customers details, namely:

- Customer's Company name
- Their contacts name and email address
- Head Office Country of Origin
- Registration Number
- VAT Number
- Distribution Centre Address
- Customs department import and export number
- Insurer Name
- Policy Number
- Any other information that will be needed

Cargo information

- Size
- Weight
- Origin
- Tariff code
- Special instructions

Hauliers

The hauliers will also load their company details on the system including all their drivers' information:

Company details:

- Customer's Company name
- Their contacts name and email address
- Head Office Country of Origin
- Registration Number
- VAT Number
- Distribution Centre Address
- Customs department import and export number
- Insurer Name
- Policy Number

Driver's details:

- Full names and surnames
- country of origin
- Identity number
- passport number
- photo of the driver
- Drivers licence information
- Biometric algorithm
- Medical Aid Information (if needed)

All documents to support this information will also to be uploaded.

The haulier will also be required to load their vehicles information on the system:

- Ownership Documents
- Make
- Model
- Type i.e. Super link, 18 wheeler Horse and Trailer, flat bed, 8 ton etc.
- VIN number
- License plate number
- License disc number
- Licence Disc Expiry date etc.

Once all this information is complete the border post user will be able to start the process.

Through our research, we have discovered that some logistic companies have in house hauliers but most have sub-contractors. This needs to be included in the CEDI system.

When a delivery needs to take place, the border post user i.e. customer or logistics company will sign in to the portal. Once they have signed in, they will fill in the particulars of the cargo including the choice of haulier that they are going to use. They will be able to choose from their own list of hauliers registered on the CEDI system. When they have chosen the haulier that they prefer from the list, the haulier will be notified. All the information about the cargo will be sent to that haulier i.e. the destination, size, weight, special instructions, tariff code etc.

The haulier will choose a driver and vehicle from their list they have compiled, which will be connected to the cargo. Thereafter, the route the driver will follow will be entered in the system by using the link to Google maps. The maps will illustrate the border posts that the driver will have to go through en-route and the border post user can see them listed on the system. Once the border post list is complete, all the digital documents pertaining to those border posts will be retrieved from the system. All the information about the border post user, drivers and vehicles will be automatically filled in the relevant fields in the digital documents for each border post.

Once all the information regarding the cargo that has been loaded on the system by the customer or Logistics Company i.e. list of the items (Packing List), the weight of the load, the dimensions, the cost of the load etc as well as all relevant supporting documents, they will be grouped together and connected to the vehicle. From this information, the road freight manifest will be automatically compiled by the CEDI system.

The haulier will then fill in on the portal if there is one stop or multiple stops. If there are multiple stops, are they picking up or dropping off, and if so they will enter the metrics required i.e. size, weight, cost etc. The system will update the documentation as per this information.

Once the border post users have completed this process, they can submit the forms for approval from the relevant customs officials. On approval of the documentation from the customs authority of the cargo's final destination, they may then proceed.

Depot Cargo Inspection

The border post user will receive a notification from the portal notifying them that their documents have been approved. Once they have received the notifications from all the Customs divisions representing the countries en-route, they can set a date to load their vehicles for cargo inspection at the point of origin. If the border post user has multiple stops, they can set a date for inspection at each drop-off and pick-up. Reason for this is a customs official will inspect the cargo against the manifest to ensure that the cargo is correct. Once they are satisfied that the cargo matches the manifest, they will attach electronic seal to the doors of the vehicle. The customs official will register the electronic seal on the portal for that cargo. The driver can then leave the depot.

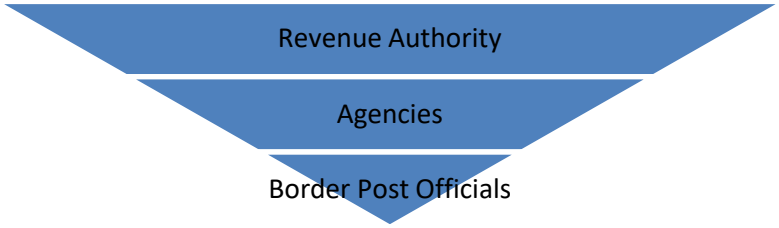
Vehicle Breakdown

In the event of a breakdown, the haulier and logistics company will be notified by the tracking system on the electronic seal. The haulier can send a replacement vehicle to the location of the broken-down vehicle. Once the replacement vehicle has been dispatched, the haulier can make the relevant alterations with the reasons of the change of vehicle on the CEDI system. The replacement will be recorded on the system and a notification will be sent to the relevant border post and officials.

Payments

The payments made through the portal will be done via the swift payment method and will reflect immediately on the recipients account. So when the vehicle gets to a certain distance from the border, the border users will get a notification for payment to be made. When the payment is made, the invoice and receipt of payment will be sent to the border post user, customs and a copy will be recorded on the CEDI system and can be referred back to at any time.

Customs (Revenue Authority, Agencies, Border Officials)



Customs, as illustrated above, is made up of different divisions. From our research, these divisions are:

1.) Revenue authority – their first and foremost function. Their job is to make sure that all taxes, duties, permits and coupons are paid in full.

2.) Agencies – such as law enforcement, Intelligence, Environmental, Agriculture, Public Works, Immigration, Port Health, etc. work together to protect the well-being of the state and its people.

3.) Border Post Officials – These officials are the last check point in the line where the correct documents are in place, to ensure taxes, duties, permits and coupons are paid and that no illegal cargo or persons enter the country.

Customs and their relevant division for all the countries of the African Union will register on the CEDI system as its own independent entity. The reason for this is to define each country's Custom division from one another and to create transparency.

When the Border post user sets their route, the documents from all countries that they need to enter or pass through, will need to be submitted. By classifying each Customs division as their own entity, the documents can be grouped accordingly for approval, whether the cargo is destined for that country or if it is in transit.

In addition to the convenience of having the documents grouped together for easy access and reporting, the transparency created between the Customs divisions will also allow effective monitoring of their different staff members and their dealings. This will assist the authorities to assess their staff members' performance in their vocation, have the information available if changes need to be made and make sure their staff members are representing the country in the correct manner.

When the Customs department register on the portal, they will initially register with:

- The head of divisions Name
- Email Address
- Password
- Country

Once this submission is approved, then the other Customs department Officials will be listed for that country, by:

- Name
- Email address
- Division they represent

Customs Officials

Revenue Authority and Agencies

Once the border post users have submitted the documents, the customs officials for that particular customs division will get a notification to inform them that there are documents available for approval. This creates a hierarchy within each country's customs.

The customs official will have three sets of documents to approve, namely:

- **Documents for the Vehicle**
- **Documents for the Cargo**
- **Documents for the Drivers**

These documents will include the digital customs forms and digital copies supporting documents.

The customs official will sign in to the portal giving them access to their account home page on the Customs portal. They will then access the documents by accepting the request on the account home page. They will process the documents on their system and click on the "Approved" button under each document. Should there be an issue with the documents the custom official can click the "not Approved" button, which will bring up a text window where the official can log the reason. The document will automatically be sent back to the border post user with the reason for it to be corrected and resubmitted.

When the documents are viewed at a later stage, the person viewing the documents will see that they have been approved by that customs official representing the country's customs department.

Once all the documents are approved, customs can submit the approved documents. The border post user will receive a notification and the commercial vehicle can leave the depot.

Border Post

Each border post will register on the portal as its own entity but will still be part of the Country's customs community. The head official at the border post will register with:

- Name of the Border Post
- Name of the Head Official
- Email address
- Password

Once this account has been approved on the portal, the rest of the officials will be registered with:

- Name
- Email address
- Identification number
- Employee number

Border Post Set-up

The border post will have a fixed camera that is paired with Optical Character Recognition software (LPR) to read vehicles number plate and another fixed camera set higher up to take a snapshot of the vehicle's occupants. Other cameras will be strategically placed in and around the border post to monitor the processes followed by officials. These will be hard-wired to the permanent local server at the border. The border officials will have a portable Identity device with a build-in palm vein scanner, and a waterproof Laptop that is also a tablet with internet access.

Process at the Border Post

At the start of their shift, the border official will log on the Customs portal to have access to their account home page. When a vehicle approaches the border post the cameras will start the process by reading the vehicles registration number and a transaction notification will be sent to the border official. The official must accept the notification to verify the documents. The acceptance will be noted on the portal as well as which border official will process the documents.

When the driver gets to the border post, he will drive up to the boom. As he gets to the boom, the camera with optical character recognition software will be triggered and will read the licence plate number of the vehicle. The licence plate number will be sent to the CEDI system and all the vehicle documents, cargo documents and driver's names and documents will appear on the border officials account home page for verification. This will be done by clicking on the verified button on each document.

At the same time, another camera will take a snapshot of the vehicles cabin, to make sure that only authorised personnel in the vehicle. The snapshot will be recorded on the portal for security purposes.

The border official will give the drivers the identity match device where they will insert their smart card and scan their palm vein for verification. If it is a match, the information will be sent to the to the border post officials device i.e. the Laptop-Tablet and the drivers documents including their

photo and their permission to enter the country will appear on the border official's account home page for verification. Again, this will be done by clicking on the verified button. However, if it is not a match the border officials will be notified and they can follow the correct procedure by impounding the vehicle.

Finally, the border official will inspect the electronic seal at the back to see if the cargo has been tampered with. They will also be able to view the route of where the vehicle has travelled for any irregularities. If the cargo has been tampered with then the border officials will click the on the tampered button on the portal and then follow their cargo inspection procedure from there.

Only when the vehicle, cargo and the drivers' information have been verified will the boom open to let them through and allow them to proceed into or out of the country.

This whole process should take about fifteen minutes to complete. Once this process is completed, the border post user will get a notification from the CEDI system informing them that their cargo has passed through the border successfully. They can log on to their account home page to view the records of the border crossing process. The customs department as well as the border post will also have a record of the vehicle, cargo and drivers, crossing into and out of the country on their server and the CEDI system.

Disclaimer: The permission for the drivers to enter into a country using the CEDI system, may only do so while driving the vehicle for a registered border post user. This does not replace the visa needed for private travel. All allocated drivers to a vehicle for a particular trip must be accounted for at each border crossing or the vehicle will not be allowed through the border post.

The effects of this portal

1) This portal will allow for a more efficient border crossing for commercial vehicles.
2) No physical documents (everything is digitised), so no documents will change hands (eliminating the cause for corruption).
3) Payments of taxes, duties, permits and coupons are instantaneous and recorded.
4) The border post can be open 24 hours a day (3 x 8 hour shifts or 4 x 8 hour shifts to allow for overlaps).
5) Eliminate the need to stop at border posts for an extended period of time causing other costly problems for the border post user i.e. vehicles overheating, have to unload the cargo for no apparent reason for inspection etc.
6) Everything gets recorded on the portal, making things very transparent between all parties involved.
7) This portal lends itself to an extension into law enforcement for all African countries i.e. central database.

Summary:

The CEDI system is the solution that connects all parties involved in cross border trade. It is the most comprehensive system that can be used by multiple countries and it addresses all the issues that the commercial border crossing process currently experiences. While at the same time not changing the existing process.

Our solution will decrease the time spent at the border posts, making road freight a much more viable and cost effective option for moving cargo across borders. The increase in efficiency will also raise the percentage Inter-Africa trading as well as commercial taxes for that country.

The CEDI system will be web and cloud based. This means that, should an issue arise, it can be fixed remotely. One thing to keep in mind is that a system like this must continuously be updated/ upgraded and maintained so it remains relevant. All upgrades/ updates will also be done remotely. There will always be challenges that arise over time which will be dealt with the upgrades.

With this solution, border posts have the opportunity or ability to operate 24 hours a day, which will go a long way to alleviate congestion caused by commercial vehicles.