MENTOR
KNOWLEDGE MULTIPLIES IN SHARING
AUGUST 2017 ISSUE # 6

EQ:
8 Great Tricks For Reading Peoples Body Language

PHOTOGRAPHIC ESSAY: YOUNG AFAR LADY

COVER ARTICLE

COMPUTER ENGINEERING

ERITREAN LANGUAGES OPERATING SYSTEM TIGRINYA OPTICAL CHARACTER READER (TOCR)

CHEMICAL ENGINEERING

DESIGN OF POTASH PROCESSING PLANT FOR COLLULI

AUGUST'S QUOTE OF THE MONTH

With

each DROP

of your

Knowledge,

we

will create the

ocean.

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MENTOR Magazine is dedicated to all High School and College Students as well as Graduates. It envisions to disseminate academic knowledge on various disciplines through sharing

Policy

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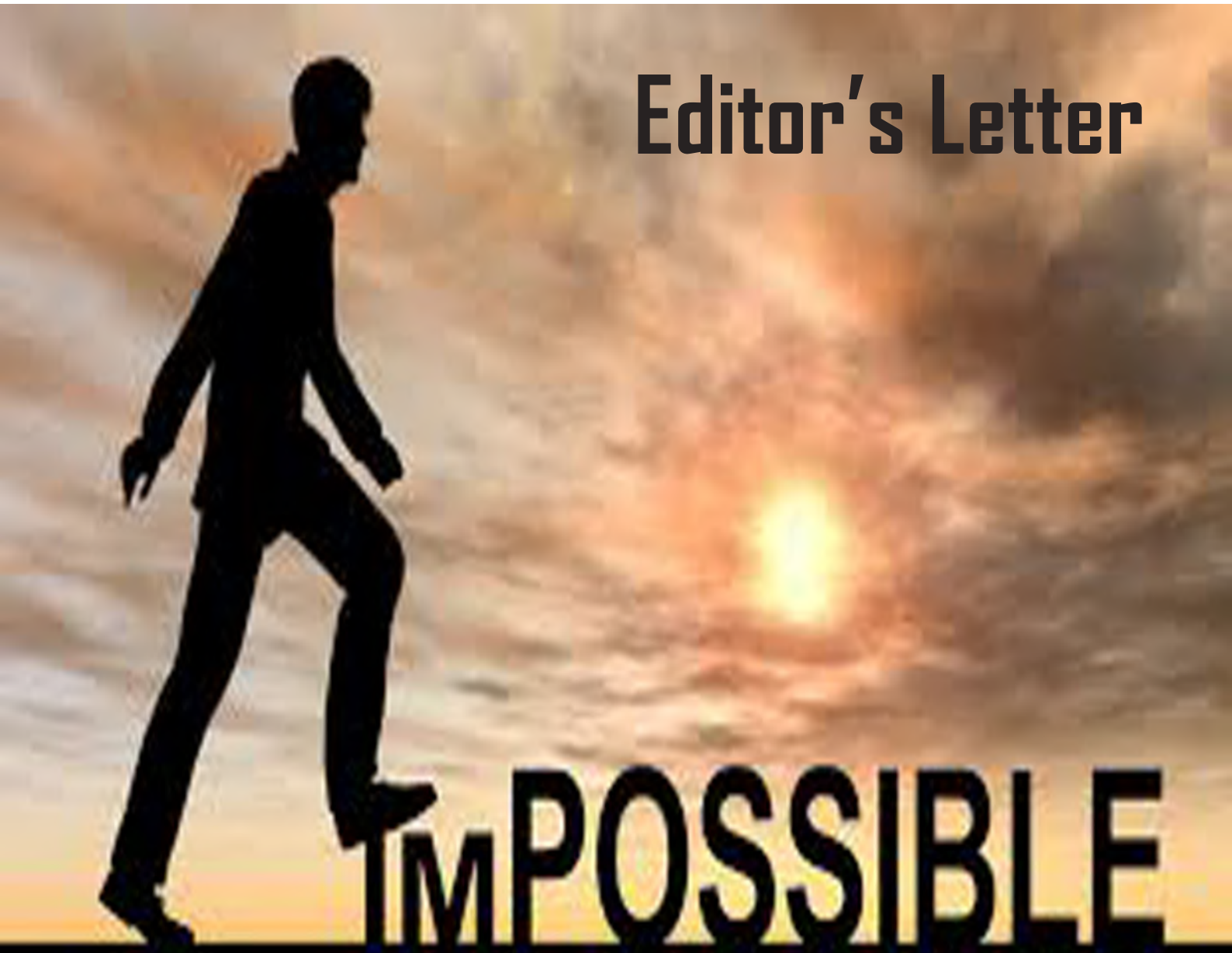

Dear Readers, We meet in this August Edition of MENTOR, with a creative designs from Computer Engineering and Chemical Engineering. What can we read from people's body language is on the EQ of this month. This month is the end of summer time and the begining of acadamic year 2017/18 with this we have brought you, image of the month as who are successful people and unsuccessfull people.

Readers can read and download this month's edition and all the previous ones for free at Facebook/Eritrean Scientific Scoiety and eriyouth. org.

Editor-in-Chief

Saba Tekeste

COMPUTER ENGINEERING

TIGRINYA OCR

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*An app that can be installed in pocket-size devices such as smartphones and tablets is hereby ready to save your life from a lot mess...

Contributor :Abel Ghebreiesus

It's an age-old problem trying to decide what to do with a bunch of printed documents and when you want them to be in digital editable form. The old and stylish way was either to hire a typewriter with good typing skills to type all the documents in a computer or to keep an image of the documents. But bunch of problems can be raised in parallel as the number of documents increased and still its undeniable fact that nobody wants to hold an image of his/her documents because their content cannot be edited and indexed. So it would be an interesting news to hear that a release of an android application that can convert your documents into a soft copy form by just taking a photo of your documents using your android phone. At first sight,this new app could be mistaken for a normal scanning app. Even though there are tons of apps that can scan your page into an imaged form but none has been developed to really extract text from an image.

What was the motivation behind the development?

In our day to day life, we often need to reprint text with modification. However, in many cases, the printable document of the text does not remain available for editing. For example, if journalists from the news room wants to include a newspaper article that was published 10 years ago in the current day's article, it is quite possible that the text is not available in an editable document such as a word or text file. So the only choice remains is to type the entire text which is a very exhaustive process if the text is large. The solution of this problem is optical character recognition(OCR). It is a process which takes images as inputs and generates the texts contained in the input.

Although much efforts have been done to develop OCR applications for other foreign languages, there has not been so much work done in recent time for the Geez scripts adapted language, Tigrinya. The main reason is because it is not quite easy to develop an OCR for Tigrinya language due to the diversity of characters and they total to a very huge number.The inter resemblance among the characters makes it even tougher to maintain the accuracy as the OCR may misjudge one character for another. The total number of characters also makes the execution time longer as the scanning process of OCR goes through a very large data set.

Where are the parties that are in really need of this app?

We can list a number of fields in our countryof which this android application, Tigrinya Optical Character Recognition (TOCR), is applicable and suits perfect…

-As we all know the storage of information in computer in compare to manual file system storage of information is new era technology in our society and country. Andit will be hard to change the stored document into soft copy which would likely take centuries if done by type writing. So the TOCR is the essential tool for your ultimate goal.

-All Library and information centers can make their old and scarceresources available to users by reproducing their resources.The application can reduce the job complexities both in time and labor.

-Our government and private organizations have huge quantities of Tigrinya paper documents that are so important that those should be stored for a long period of time. To do so making electronic copies of those documents are important and it can be done by using the TOCR app.

There is no doubt that TOCR is easy to use and that you can produce some very accurate result in a short space of time. Itcan be used by all android smart phones sinceit requires the basic hardware requirements like camera.

What are the technical process that occur in background?

Optical character recognition (OCR) is the mechanical or electronic translation of scanned images of hand written, typewritten, or printed text, to machine encoded text. The open source OCR API called Tesseract is used as a basis for Image Recognition. Tesseract is considered the most accurate free OCR engine in existence. In our project we will be using of the tesseract OPEN SOURCE library.

Tesseract works with independently developed Page Layout Analysis Technology. Hence Tesseract accepts input image as a binary image. Tesseract can handle both, the traditional Black on White text and also Inverse-White on Black text. Outlines of component are stored on connected Component Analysis. Nesting of outlines is done which gathers the outlines together to form a Blob. Such Blobs are organized into text lines. Text lines are analyzed for fixed pitch and proportional text. Then the lines are broken into words by analysis according to the character spacing.

Since text extraction from image is one of the complicated areas in digital image processing we will be using a number of steps to provide clear and concise output text.Since Tesseract was originally designed to recognize only English text there are not any prepared trained data for the Geez language. Here our effort was to build the training tools for the Geez Language.

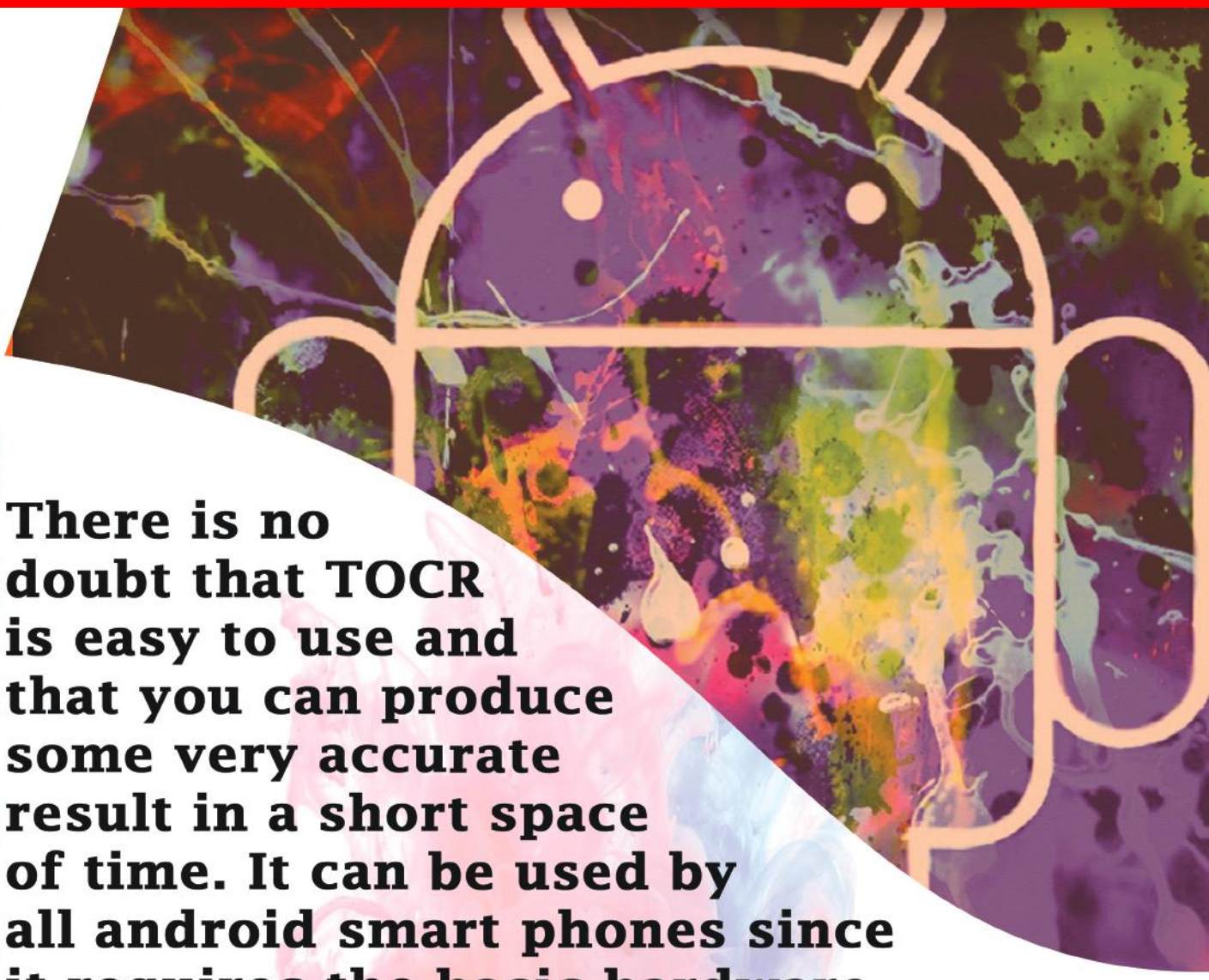
Exiting Feature

*It is capable to convert both English and Tigrinya documents.

An app that can be installed in pocket-sized devices such as smartphones and tablets is hereby ready to save your life from a lot mess...

Tips for better accuracy

*User needs to take a photo as possible as clear and proper through phone camera so that it can easily recognized.



HOW IT WORKS

There is no doubt that TOCR is easy to use and that you can produce some very accurate result in a short space of time. It can be used by all android smart phones since it requires the basic hardware requirements like camera.

Just take photo of your documents and run the ocr

Soft-Copy Document

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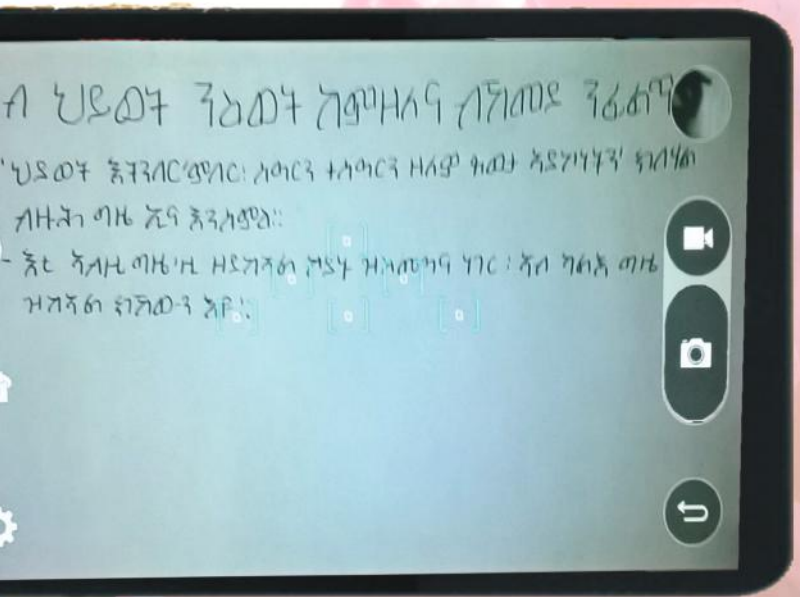

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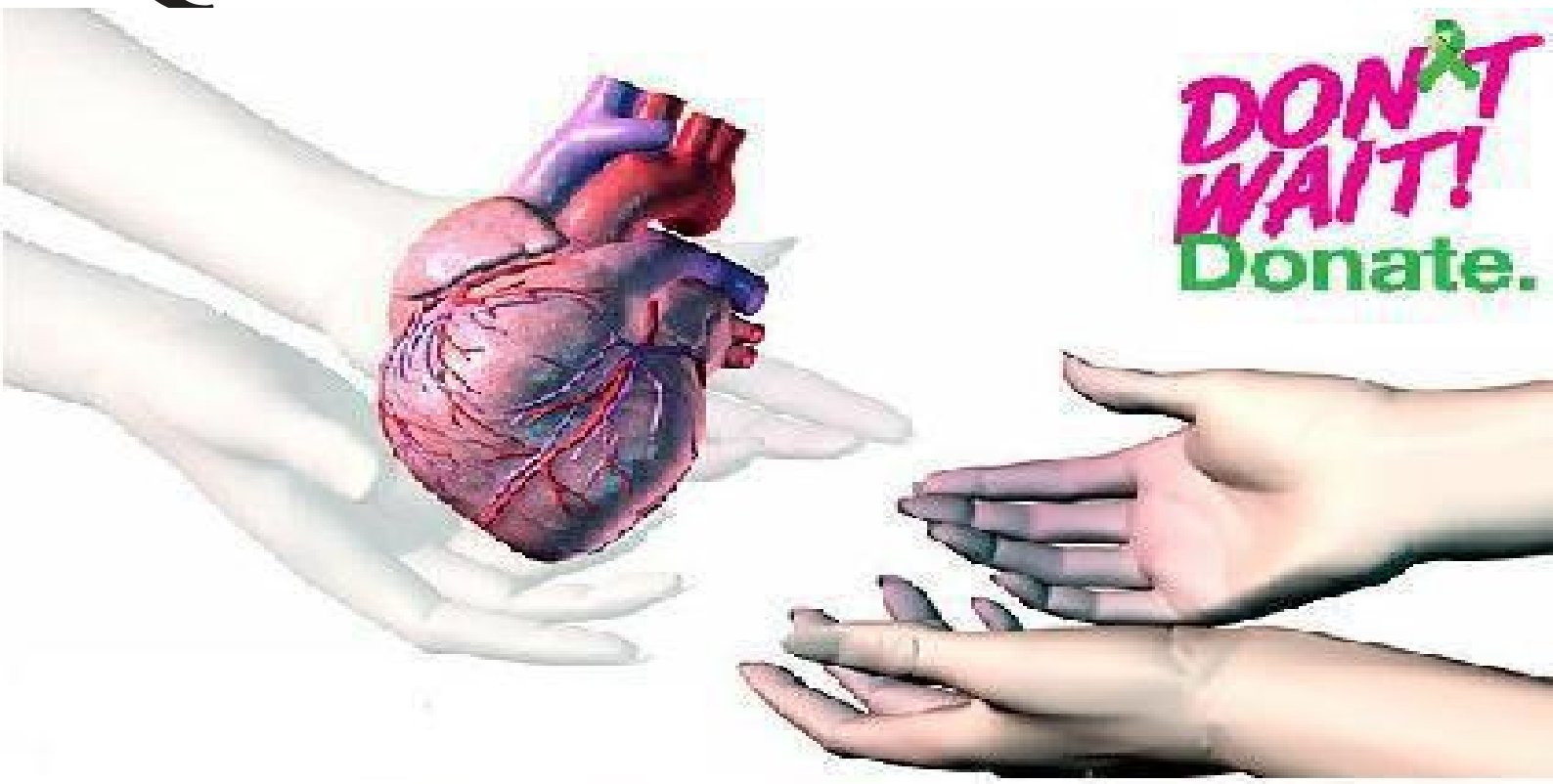
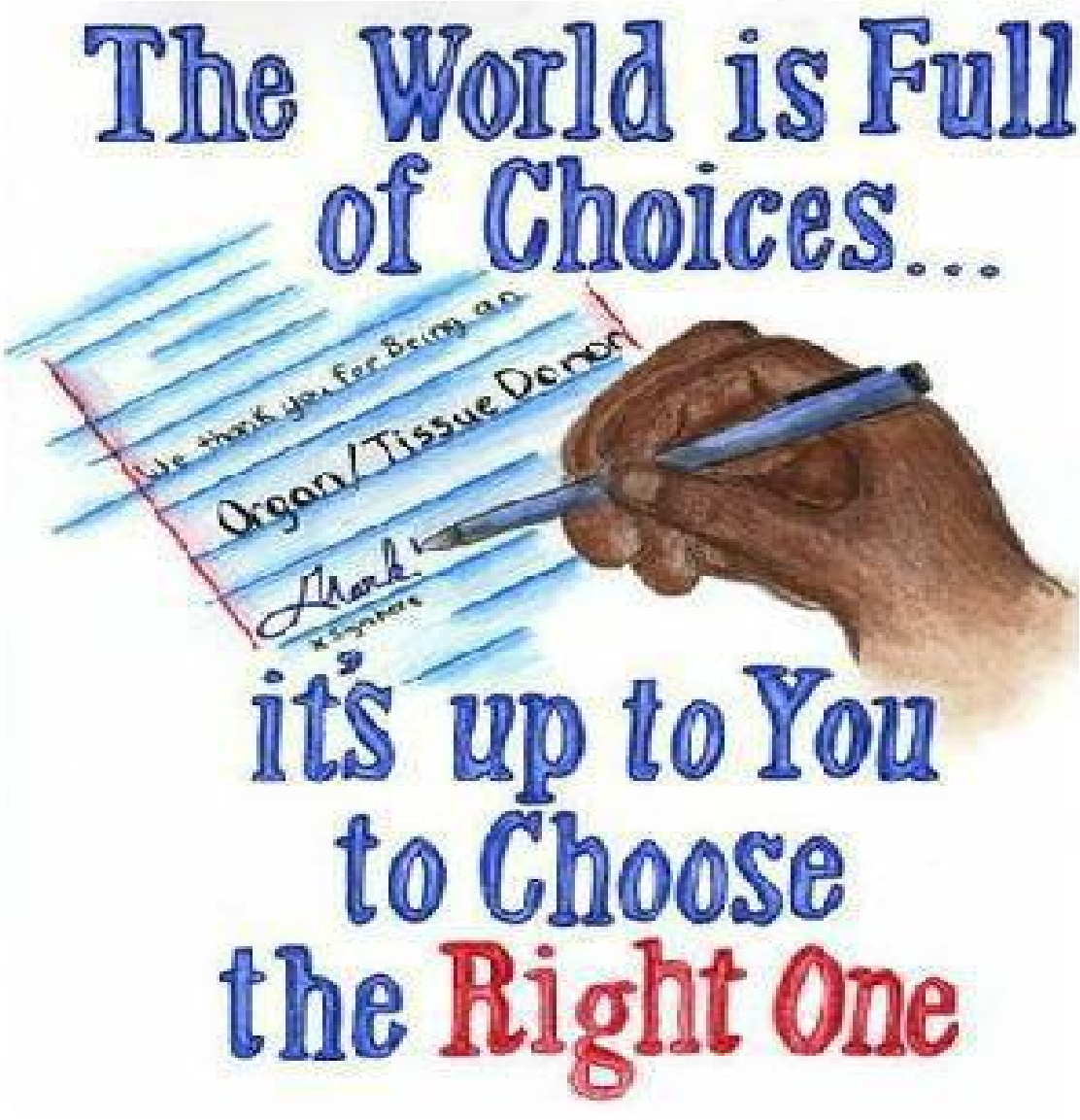
QUOTE OF THE MONTH





ERITREAN LANGUAGES OPERATING SYSTEM

- BEREKET KIBROM
- ESROM TEKESTE
- NAHOM YEMANE
- SELAM GOITOM
- SHAM MESFN
- YONATHAN GHEBREMESKEL

Compiled by: Sham Mesfn

Introduction

According to Wikipedia, an Operating System (OS) is a software, consisting of programs and data that runs on computers and manages the computer hardware and provides common services for efficient execution of various application software. Examples of popular modern operating systems for personal computers are Microsoft Windows, Mac OS X, and GNU/Linux. Android is the most popular operating system for mobile, wearable, and IoT (Internet of Things) devices.All of the free or commercial operating systems on the market are designed with a specific target market in mind. For instance, Mac OS is designed to be compatible with the hardware and software requirements of Apple's own Mac computers. Android is designed to work on the low space and memory requirements of mobile phones. With the exception of the Windows OS, all of the above-mentioned operating systems run on the Linux kernel.

What is ELOS?

ELOS stands for Eritrean Languages Operating System. The idea for creating this project came from our observation of the importance of computers in our community. Due to the lack of adequate English language and other technical problems, our people have a limited understanding of what computers can do. Their main jobs are limited to entertainment and the occasional office works. So the project plan was to set thecomputer illiteracy from an early stage; preferably from their primary education. To do that, the students have to use the computer in a language that they arealready familiar with. In our case, it's the local language in general and more specifically the Tigrigna language simply because it's the language that we as a group felt comfortable translating.
The first version of these series of operating systems is called the ELOS NATNA and took about two years to develop. NATNA coms pre-configured with two languages; Tigrinya and English. Subsequent versions of ELOS are planned to be released in a two-year interval with further improvement and additions of another Eritrean language with each new release.

Drawbacks of the existing Operating Systems

The main drawback with almost all of the existing operating systems in use today is the fact that they try to satisfy a wide range of users. This is a useful concept from a globalization point of view where everybody speaks or at least reads and writes the same set of languages. But everybody doesn't know English, French or any other of the mainstream languages. An Eritrean farmer, a Somali fisherman or a Canadian Doctor should be able to use a computer with the same privileges as long as they can read and write in their local language. Some of the most advanced Linux distributions, such as Linux Mint and Ubuntu, try to solve this problem by introducing multiple language selection but only a small portion of the interface or input methods are changed. The support for local software developers is limited with almost all of the existing Linux-based operating systems. You have to go through a tedious process of registration and some payment procedures just to have the opportunity to publish your work on the net. Of course, the amount is not that much but even the payment procedures do not consider software developers in developing countries such as Eritrea.

Significance of Language

Language is one of the main pillars of civilization. Without language, human civilization would not have evolved as we know it today. In Eritrea, there are nine different ethnic groups, each with their own unique language that is at the heart of their unique customs and traditions. Each and every one of these languages has its own set of rich vocabulary that has been in use for centuries.

Our national languages are lagging behind when it comes to term of the 21st century in general and of technology/science in particular. There are virtually no spoken or written terms for computing, internet, and everything else that really matters in this century. To illustrate this point, lets us look at the following examples that compare English words with their corresponding Tigrinya words.

- Table =
- Chair = ኩርሲ
- Mouse =???
- Keyboard =???
- Folder =???
- Web Browser =???
- Desktop =???

The examples above may be comparing Tigrinya terms with English but they all apply to the rest of our languages equally. Our national languages do not have terms for technological and scientific terms and even those few that do exist are rarely used by the public. In the long run, this will hurt the language badly as more and more people begin using computers or smartphones for their daily activities and for browsing the web. The language we use in the physical world is actually dead in the virtual one and that is a really scary thought! If we cannot use our own language in the virtual world, how long will it be before our culture dies with it too?

Goals and Objectives of the Project

"Regardless of Educational background, Geographical location and Social Status, Everybody Should live in this century"

Objectives:

- Computer Illiteracy at an early age
- Development and international recognition of local languages
- Support local software developers
- Introduce interactive educational applications in schools
- Promote innovation
- Recycling used computer systems for educational purposes

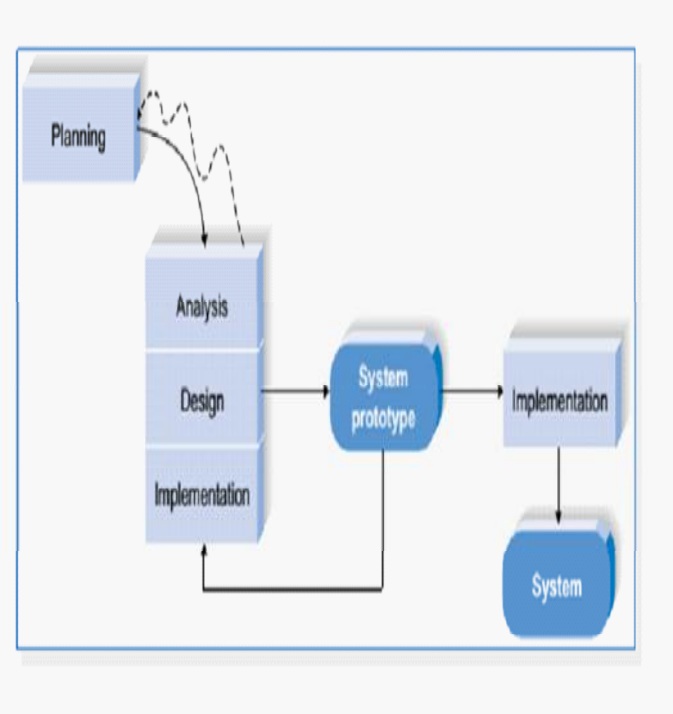
Target Users

Technical Stuff

Development Methodology

A methodology is a formalized approach to implementing the Software Development Life Cycle, i.e., it is a list of steps and deliverables.

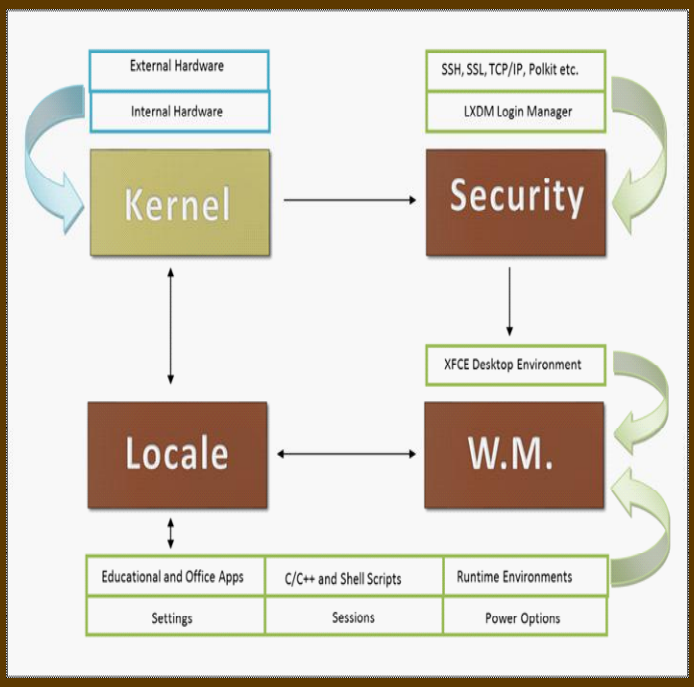
The ELOS development methodology was based on the principles of the Prototype Model. A fully-functioning prototype of the OS was developed at the end of a predefined interval of times. The prototype is then analyzed and then return back to the "factory" for some more works until the final version was obtained.



System Requirements

The NATNA OS was designed to run with the lowest resources possible to comply with one of the fundamental principles of ELOS, i.e. reusing of old computers. The OS can run on systems with RAM memory as low as 128 MB, hard disk space of only 20 GB and processor architecture of either 32-bit or 64-bit systems. The OS is also portable and can run from any computer via a pen drive without having to install anything.

Architecture



Programming Languages

The Linux kernel is coded using the C++ language so that was the most used language when building and modifying the core contents of the operating system. For the front-end design and some additional feature applications, Java language was used as the main language of choice. The OS also support any other java-based third-party application, such as Geez IME and YagaLite (Tigrigna Word Processor).

Future Plans

With regards to the first version of the OS, i.e. NATNA, the following plans are in place for further implementation

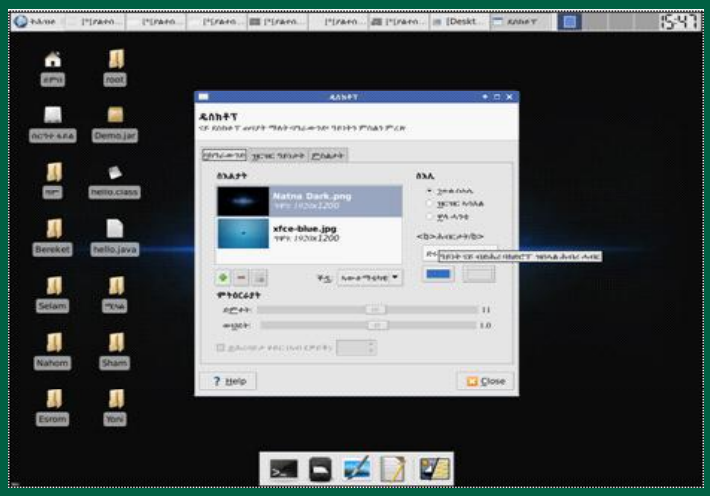
- To install the OS in every primary/junior school labs in the country
- To have communal computer labs in rural areas where people can use computers in their own language
- To garner international recognition
- The formation of ELOS Foundation to support local developers and provide free source codes of the operating system for further improvements.

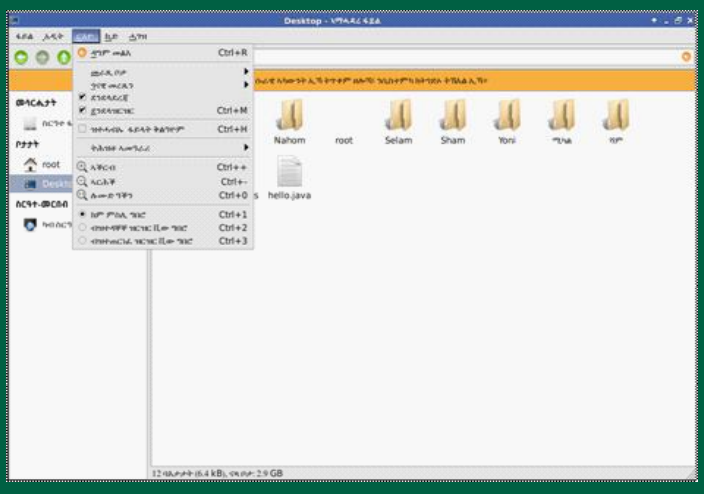
Future Enhancements

This project being the first of its kind in our country, it has a lot of areas that could be expanded upon. Following are some of these enhancements that could be implemented in the next versions of the Operating System:

- Inclusion of all national languages and some regional languages
- Thin-client computing capabilities whereby many users can access one computer simultaneously
- Voice-aid capabilities for the visually impaired users
- More educational applications
- Expansion to embedded devices such as smart phones, tablets and IoT devices

Interface





DESIGN OF POTASH PROCESSING PLANT FOR COLLULI

Researchers From Chemical Engineering Department

- Aster Medhanie
- Henok Michael
- Samsom Mebrahtu
- Sium Solomon
- Tesfaldet G/micheal

Introduction

Potassium is one of the three basic plant nutrients along with nitrogen and phosphorous. There is no substitute for potassium compounds in agriculture; they are essential to maintain and expand food. Around 90% of potash produced world-wide is used in agriculture. Other industrial uses are glass manufacturing, soaps, pharmaceuticals, plastics and explosives making industries. The paper will focus about the potash found around the Danakil depression in Eritrea in huge amount of deposit in which the potash ore found contains majorly sylvinite,carnallitite and kainitite compounds. The geological survey conducted on it confirms that it can run up to 200 plus years so its timely objective to design a plant which can boost our nation economic status since potash is highly demanded compound for its various applications. Our research consists : Design of the plant and major equipment's in the plant, all the energy and mass balance around the plant equipment, at last we have determined the commercial potential of potash in economic sector and the environmental assessment.

What is potash?

Potash is the common name given to a group of potassium-bearing minerals such as potassium chloride, potassium sulphate, potassium magnesium sulphate, potassium nitrate and various mined and manufactured salts containing the element potassium. The term potash arose from the traditional practice of producing potassium carbonate, needed for making soap, by the leaching of wood ashes in large iron pots. The ash-like crystalline residue remaining in the large iron pots was called "pot ash". While there are a number of such minerals, only those that are water-soluble are of significant commercial interest. The most common commercial product is potassium chloride ("KCl"), also known as muriate of potash ("MoP") or sylvite, a naturally occurring pink mineral.

Features and Benefits of Potassium Sulphate(sop)

- SOP provides both potassium and sulphur in soluble forms.
- SOP contains no chloride and hence has a much lower salt index than MOP. Where soils are saline or sodic and where irrigation water may have high chloride levels SOP is the preferred form of potassium to use.
- Where seeds or transplants are placed in direct contact with fertilizer, SOP is much less likely to cause root burn of plants.
- Potassium stimulates the growth of strong stems and gives the plant some disease resistance by promoting thickness of the outer cell walls. Adequate potassium can reduce moisture loss from growing plants, thereby giving some drought resistance. Potassium improves color, flavour and storing quality of fruit and vegetables.

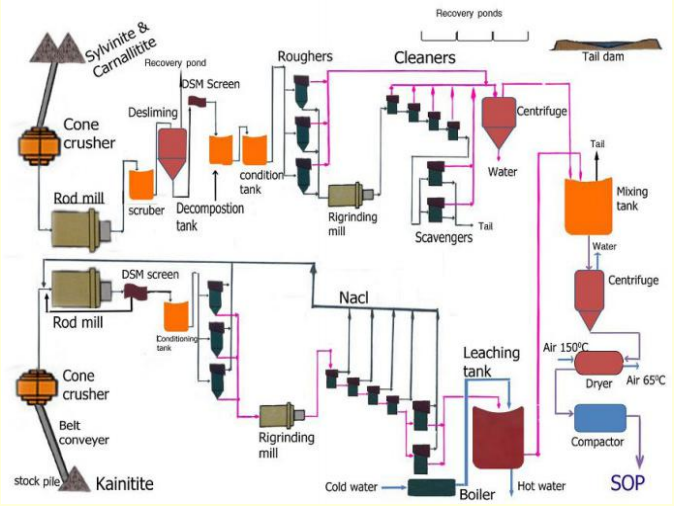
Environmental Setting

The Colluli deposit is located in the Danakil region of Eritrea, East Africa. Colluli is approximately 177km south-east of the capital (350km by road), Asmara and 180km from the port of Massawa (230km by road), which is Eritrea's key import/export facility. Colluli is located proximate to the key potash markets of the future. Demand for fertilizer is driven by population growth which directly translates to food demand.

Potash Ore Processing

The production of marketable potash from the basicore may comprise a series of processes, includingcrushing and pre-screening, milling, flotation, drying,granulation and refining. Potash occurs in soft depositsgenerally associated with sodium chloride and varying amounts of clay slime, which because of its colloidalcharacter, complicates the beneficiation process. Potash ores generally contain 20 to 40 percent KCL withthe balance being NaCl and a small amount of clayslime.

Generally there are four major sections in our processing plant. They are size reduction or liberation of the desired mineral, separation by flotation &leaching, mixing & reaction and finally drying &resizing to the market size. This is shown in the flow chart below:

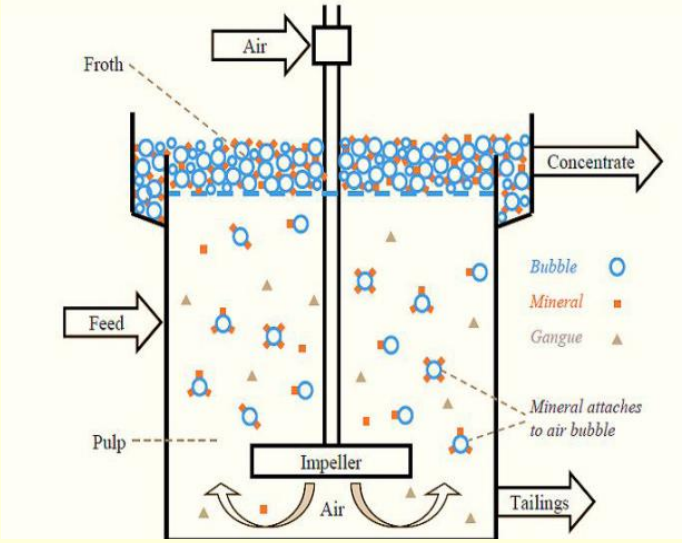


Process Description

The three types of ore are stoke piled as sylvinite, carnalitite and kaintite separately. Sylvinite and carnalitite are processed by blending in a ratio of 1:2.7 and kainitite is processed in the second circuit. The intermediate product of the two circuits will be mixed at the mixing tank in which SOP yielding reaction takes place. The sop will be dewatered and compacted. The desired composition of the SOP is to be 98% pure to meet the requirement of supplying potassium and sulphur for chlorine sensitive plants.

Principles of Froth floatation (mechanism of separation)

Froth flotation is a highly versatile method for physically separating particles based on differences in the ability of air bubbles to selectively adhere to specific mineral surfaces in mineral/water slurry. The articles with attached air bubbles are the carried to the surface and removed, while the particles that remain completely wetted stay in the liquid phase. Froth flotation can be adapted to a broad range of mineral separation, as it is possible to use chemical treatment to selectively alter mineral surfaces so that they have the necessary properties for the separation. It is currently in use for many diverse applications, with a few examples being: separating potassium chloride (sylvite) from sodium chloride (halite); separating sulphide minerals from silica gangue (and from other sulphide minerals); separating coal from ash-forming minerals. It is particularly useful for processing fine-grained ores that are not amenable to conventional gravity concentration. The principle is given below.



Design Aspect

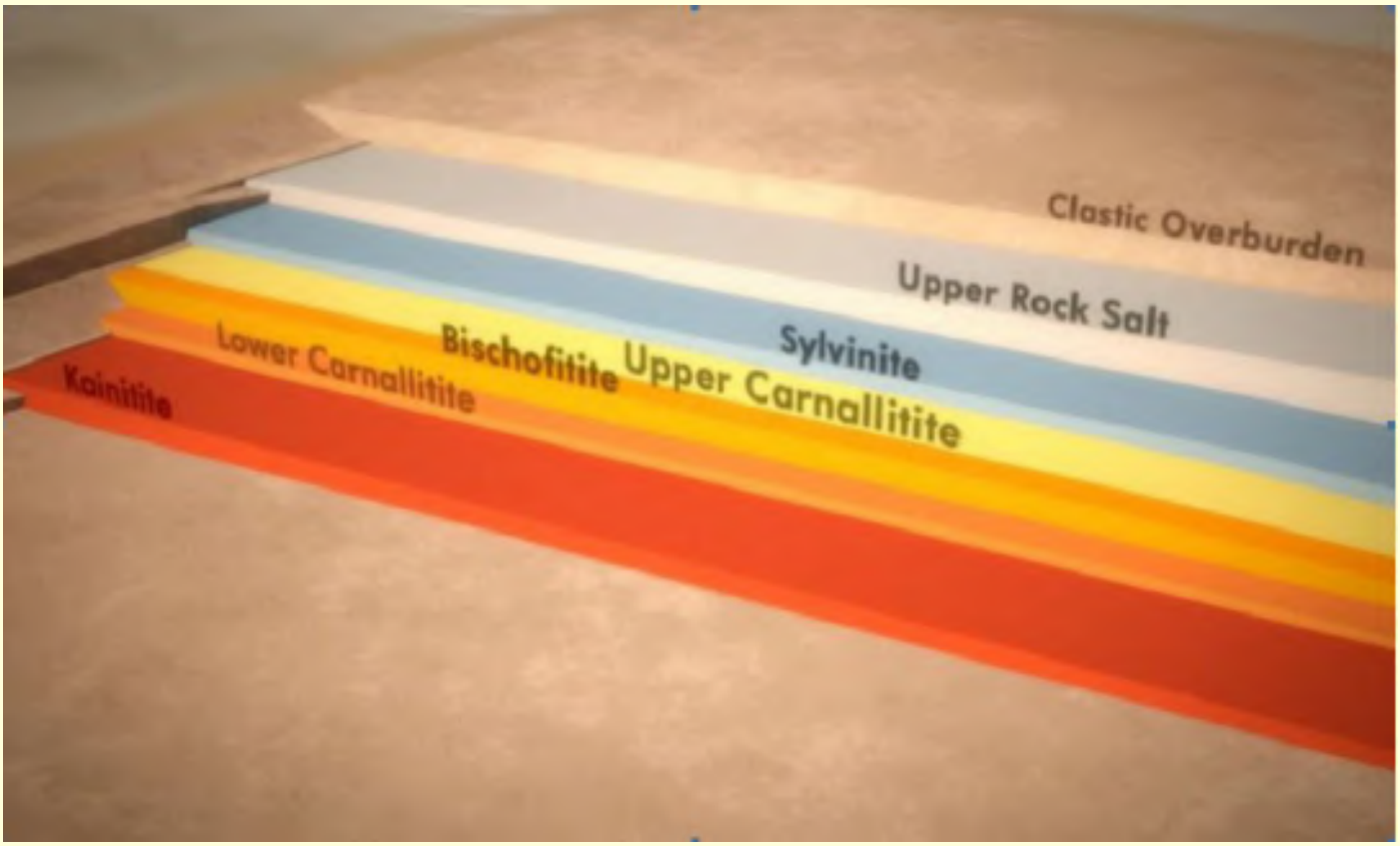
Our plant is composed of combination of froth flotation and hot leaching .we have designed flotation tank and rotary drier .we made an analysis on rod mill cone crusher centrifuge screens cyclone separator compactor and so on….we have calculated energy and material balance of each equipment and finally cost estimation and hazard analysis. We chose the site for our plant to be near the mining site about 2-3 Km. For a close distance supply of mined potash ore. The finished SOP product will be packed and loaded on trucks to massawa port. From there it will be dispatch. As future enhancement, since Anfile bay is only about 75Km it is economically favorable to build a port from the first five years revenue.

Conclusion

Demand for potash is expected to substantially increase over the coming decades as the global population continues to grow by approximately 80 million per year. Potassium sulfate fertilizer has a limited primary production center globally as a result of geological scarcity. Our design is set to become a primary production center and is geographically and economically favorable relative to current and key markets of the future. Taking its profitability and its dominance in the fertilizer market into account, it would bring ground shaking boost for Eritrean economy and it could boost the nation's skilled work force.

Limitation

In our project, non availability of some reagents in our country has set some limitations for accurately quantification of our small scale production. We used other optional reagents having versatile applications. Since these reagents are needed in minute amounts it is better to be imported to be available for further experimental works. This will help for the implementation of additional industries.




SUCCESFUL PEOPLE
Compliment
Have a sense of gratitude
Forgive others
Give other people credit for their victories
Accept responsibility for their failures
Read everyday
Keep a journal
Talk about ideas
Want others to succeed
Share information and data
Keep a "to-be" list
Exude joy
Set goals and develop life plans
Embrace change
Continuously learn
Keep a "to-do/project" list
Operate from a transformational perspective
UNSUCCESFUL PEOPLE
Criticize
Have a sense of entitlement
Hold a grudge
Take all the credit of their victories
Blame others for their failures
Watch TV everyday
Say they keep a journal but really don't
Think they know it all
Fear change
Fly by their seat of their pants
Operate from a transactional perspective
Talk about people
Secretly hope others fail
Horde information and data
Don't know what they want to be
Exude anger
Never set goals

PHOTOGRAPHIC ESSAY

Look throughly on how the photographer has managed to freez the moment and capture the young Afar lady's reaction between smile and amusement. Splendid!

The photographer again manages to take a freezed reaction on the faces of those magnificent Afar ladies

Look at those gentlemen with their trade-marked head bands. The guy whose face is shown is groom and his friends before are about to join their trditional dancing.

8 GREAT TRICKS FOR READING PEOPLES BODY LANGUAGE

Human Behaviour in Numbers

In the following series, Dr. Travis Bradberry's captivating lessons on Emotional Intelligence wil be covered. Dr. Travis Bradberry is an award-winning co-author of Emotional Inteligence 2.0 and the co-founder of TalentSmart® the world's leading provider of emotional intelligence tests and training serving more than 75% of Fortune 500 companies. His bestselling books have been translated into 25 languages and are available in more than 150 countries.

Body language provides an amazing amount of information on what other people are thinking if you know what to look for. And who hasn't wanted to read people's minds at some point?

You already pick up on more body language cues than you're consciously aware of. CLA research has shown that only 7% of communication is based on the actual words we say. As for the rest, 38% comes from tone of voice and the remaining 55% comes from body language. Learning how to become aware of and to interpret that 55% can give you a leg up with other people.

When you're working hard and doing all you can to achieve your goals, anything that can give you an edge is powerful and will streamline your path to success.

TalentSmart has tested more than a million people and found that the upper echelons of top performance are filled with people who are high in emotional intelligence (90% of top performers, to be exact). These people know the power that unspoken signals have in communication, and they monitor body language accordingly.

Next time you're in a meeting (or even on a date or playing with your kids), watch for these cues:

1. Crossed arms and legs signal resistance to your ideas. Crossed arms and legs

are physical barriers that suggest the other person is not open to what you're saying. Even if they're smiling and engaged in a pleasant conversation, their body language tells the story. Gerard I. Nierenberg and Henry H. Calero videotaped more than 2,000 negotiations for a book they wrote on reading body language, and not a single one ended in an agreement when one of the parties had their legs crossed while negotiating. Psychologically, crossed legs or arms signal that a person is mentally, emotionally, and physically blocked off from what's in front of them. It's not intentional, which is why it's so revealing.

2. Real smiles crinkle the eyes. When it comes to smiling, the mouth can lie but the eyes can't. Genuine smiles reach the eyes, crinkling the skin to create crow's feet around them. People often smile to hide what they're really thinking and feeling, so the next time you want to know if someone's smile is genuine, look for crinkles at
the corners of their eyes. If they aren't there, that smile is hiding something.

3. Copying your body language is a good thing. Have you ever been in a meeting with someone and noticed that every time you cross or uncross your legs, they do the same? Or perhaps they lean their head the same way as yours when you're talking? That's actually a good sign. Mirroring body language is something we do unconsciously when we feel a bond with the other person. It's a sign that the conversation is going well and that the other party is receptive to your message. This knowledge can be especially useful when you're negotiating, because it shows you what the other person is really thinking about the deal.

4. Posture tells the story. Have you ever seen a person walk into a room, and immediately, you have known that they were the one in charge? That effect is largely about body language, and often includes an erect posture, gestures made with the palms facing down, and open and expansive gestures in general. The brain is hardwired to equate power with the amount of space people take up. Standing up straight with your shoulders back is a power position; it appears to maximize the amount of space you fill. Slouching, on the other hand, is the result of collapsing your form; it appears to take up less space and projects less power. Maintaining good posture commands respect and promotes engagement, whether you're a leader or not.

5. Eyes that lie. Most of us probably grew up hearing, "Look me in the eye when you talk to me!" Our parents were operating under the assumption that it's tough to hold someone's gaze when you're lying to them, and they were right to an extent. But that's such common knowledge that people will often deliberately hold eye contact in an attempt to cover up the fact that they're lying. The problem is that most of them overcompensate and hold eye contact to the point that it feels uncomfortable. On average, Americans hold eye contact for seven to ten seconds, longer when we're listening than when we're talking. If you're talking with someone whose stare is making you squirm—especially if they're very still and unblinking—something is up and they might be lying you.

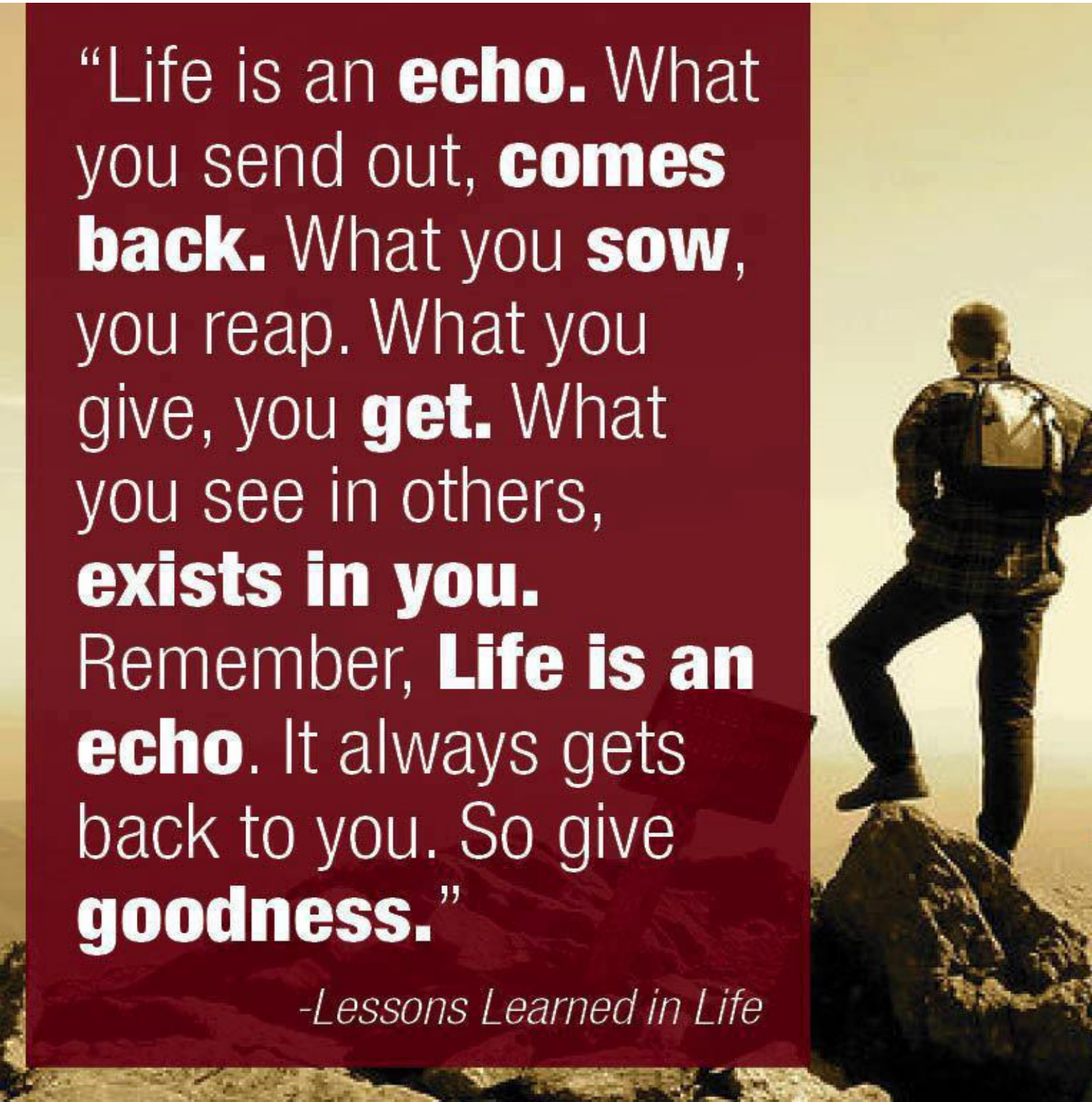
6. Raised eyebrows signal discomfort. There are three main emotions that make your eyebrows go up: surprise, worry, and fear. Try raising your eyebrows when you're having a relaxed casual conversation with a friend. It's hard to do, isn't it? If somebody who is talking
to you raises their eyebrows and the topic isn't one that would logically cause surprise, worry, or fear, there is something else going on.

7. Exaggerated nodding signals anxiety about approval. When you're telling someonesomething and they nod excessively, this means that they are worried about what you think of them or that you doubt their ability to follow your

8. A clenched jaw signals stress. A clenched jaw, a tightened neck, or a furrowed brow are all signs of stress. Regardless of what the person is saying, these are signs of considerable discomfort. The conversation might be delving into something they're anxious about, or their mind might be elsewhere and they're focusing on the thing that's stressing them out. The key is to watch for that mismatch between what the person says and what their tense body language is telling you.

Bringing It All Together

The bottom line is that even if you can't read a person's exact thoughts, you can learn a lot from their body language, and that's especially true when words and body language don't match.



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