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Topic: United States Army Machine Foreign Language Translation (MFLT) Capability Update and Review

As early as June 2003, the United States Army partnered with United States Joint Forces Command to review language requirements within the Army, and, to a lesser extent, the other United States Military Services. After review of missions that require language translation, in 2005 the Army completed an Analysis of Alternatives document, which served as an independent assessment of potential language translation alternatives: options and numerical assessments based on each option's ability to address language translation requirements.

Of the four identified alternatives (printed materials, government off the shelf, commercial off the shelf, and overarching program), incremental development of two-way speech and text translation software modules proved to be the most mission and cost effective.

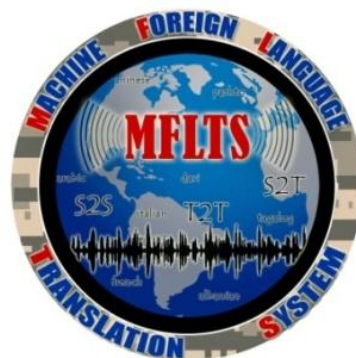
That same year, United States Department of Defense published the Defense Language Transformation Roadmap listing a requirement for a coherent, prioritized, and coordinated multi-language technology research, development and acquisition policy and program. Since 2005, the Army and the Joint Staff have validated requirements for machine foreign language translation capability. In the effort to develop a comprehensive machine foreign translation capability, the Army not only needs to enable software to handle one of the most complex systems that humans deal with, but we need to develop the architecture and processes to routinely produce and maintain this capability.

The Army has made the initial effort, funding a machine foreign language translation program known as the Machine Foreign Language Translation System (MFLTS) Program. It is intended to be the overarching Army Program with Department of Defense interest to provide machine foreign language translation capabilities that meet language translation gaps. MFLTS will provide a basic communications and triage capability for speech and text translations and improve those capabilities as the technology advances.

Capabilities are intended to be delivered through three configurations: over established networks (web based), in mobile (or desktop) configurations and on portable platforms (or man wearable microprocessors and/or handhelds). MFLTS software, as a mission enabler ported on other platforms and systems, will provide Joint, Allied/Coalition units and personnel with language translation capability within the full range of military operations. Most recently, the Army convened a Machine Foreign Language Translation System (MFLTS) General Office Steering Group (GOSG) in March 2012 and validated follow-on language, domain and technology required capabilities for the Army MFLTS Program beyond the initial capability scheduled for 2014.



U.S. Army Machine Foreign Language Translation System (MFLTS)



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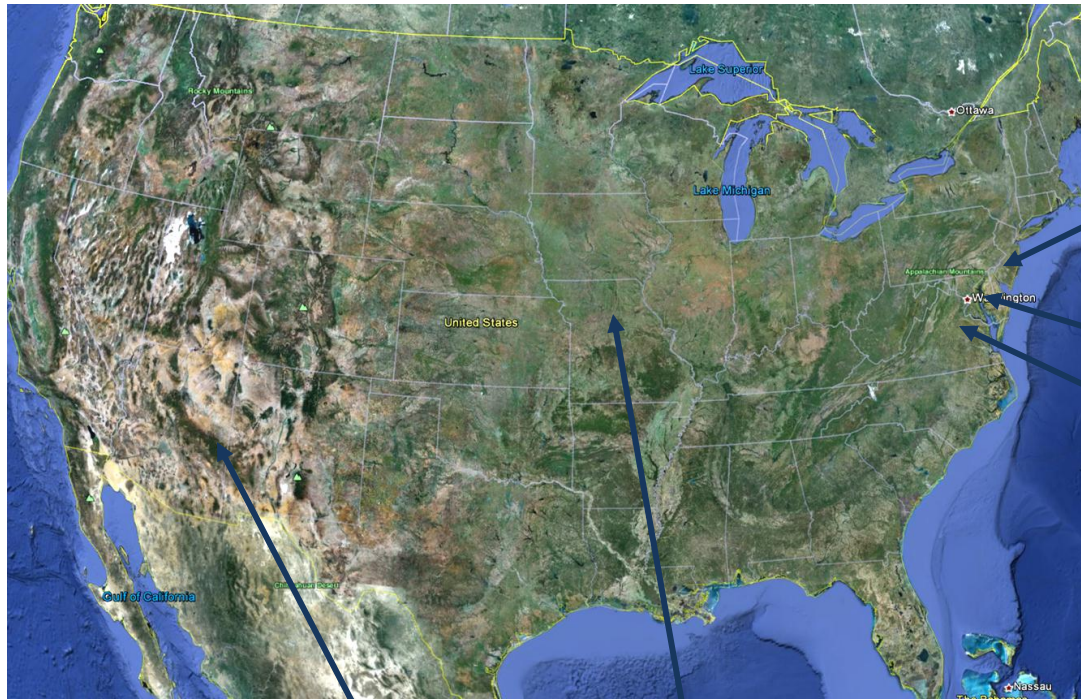


Outline

- **United States Army Machine Foreign Language Translation System (MFLTS) – Who We Are**
- **A view of our Capability**
- **Types of Development**



United States Army Machine Foreign Language Translation System (MFLTS) – Who We Are



Arizona
Ft Huachuca

Missouri
St Louis

New Jersey
Eatontown, NJ

Maryland
Aberdeen, MD

VIRGINIA
Fort Belvoir

Mission: Develop, field, and sustain a basic automated foreign speech and text translation capability into Army tactical systems in order to augment and complement limited human linguistic resources across all echelons in all environments



Description

MFLTS is a software-only program that will develop, acquire, field, and sustain a basic automated foreign speech and text translation capability into U.S. Army systems. The language development design allows for technical insertion of software language modules performing translation as required by the U.S. Army.



Characteristics

- Portable (wearable or handheld), mobile (laptop), and web-enabled configurations
- Interoperable with commercial-off-the-shelf (COTS), or government-off-the-shelf (GOTS) automation equipment
- Plug-n-play language modules - a unit that translates between specific languages
- Rapid development and deployment of new language modules to meet warfighter operational needs
- Capable of deploying on multiple operating systems (e.g. Windows, Linux, Solaris)

Not a "device" ... but rather an innovative Software Intensive Program employing modular, open system architecture

Vision: To be a high performance and learning organization that delivers world class products to the Warfighter and takes care of people.

Capabilities

2WS2S = Two-Way Speech-to-Speech
 2WT2T = Two-Way Text-to-Text
 COTS = Commercial Off-the-Shelf
 GOTS = Government Off-the-Shelf
 MSA = Modern Standard Arabic

Initial Capability:

Speech	Text
<u>2WS2S</u> translation	<u>2WT2T</u> translation
3 languages (Pashto, Iraqi Arabic, & MSA)	2 languages (Dari & MSA)
portable & mobile configurations	mobile & web-enabled configurations
<u>2 domains</u> (checkpoint operations & base security)	<u>2 domains</u> (checkpoint operations & base security)

- **Follow-on Capability:** modules for additional languages, dialects (for already developed languages), OCR for handwriting, and technological upgrades.

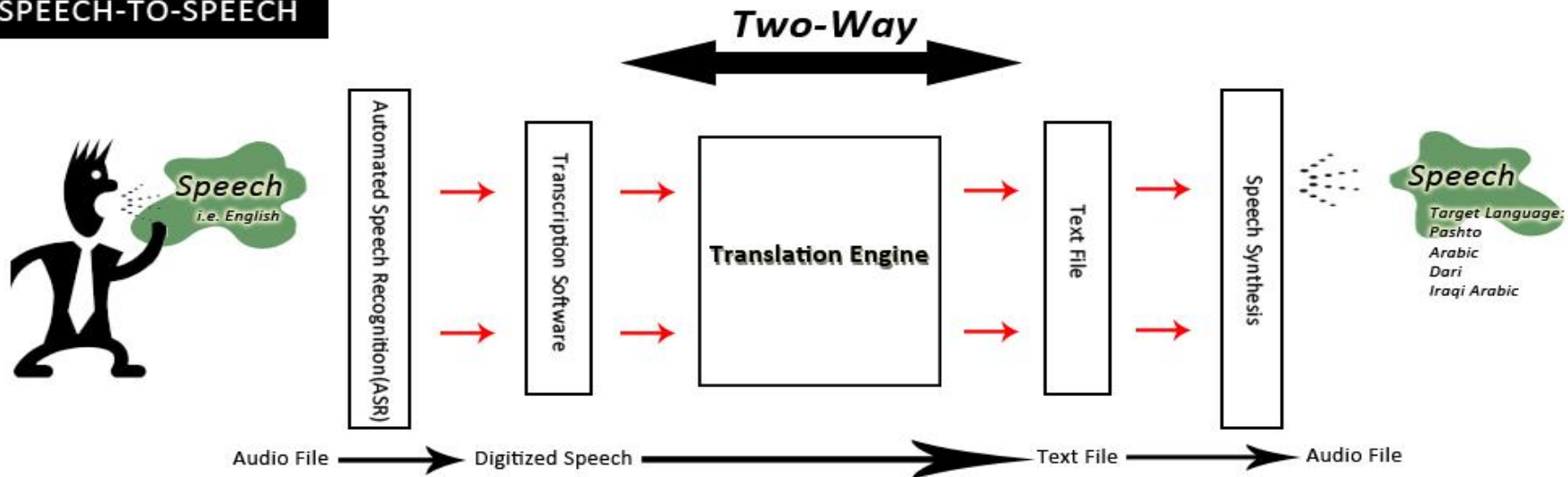
Benefits

- Greatly increases points of presence for foreign language translation capabilities on the battlefield
- Enables communications with foreign speakers when human linguists are not available, enhancing mission success with:
 - Host Nations
 - Coalition partners
 - Indigenous peoples
- Enables rapid translations and triage of documents and media focusing analysts on the most important documents/media for exploitation

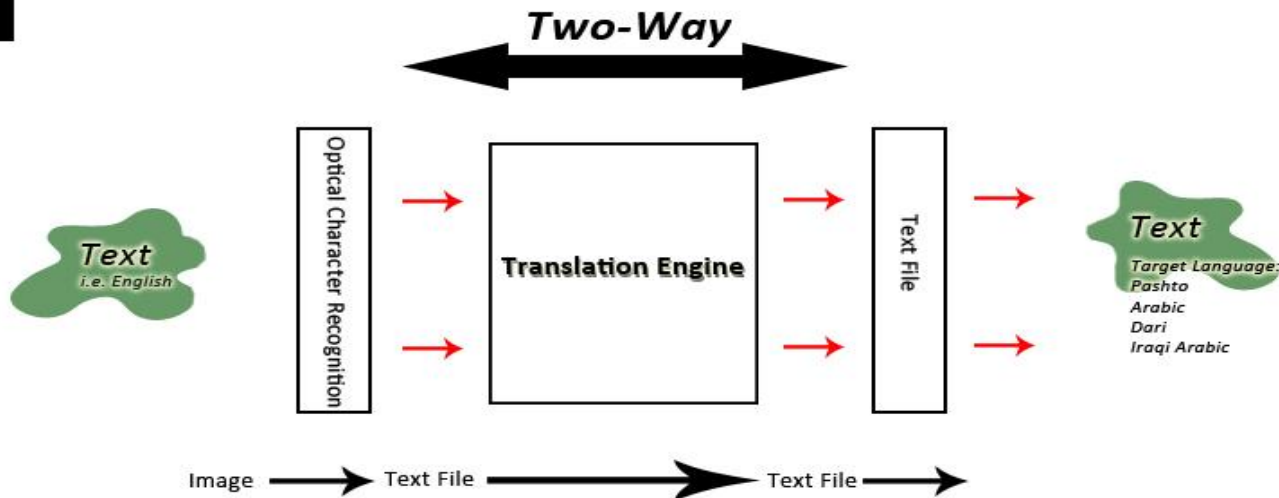
President Obama "... in the 21st century, military strength will be measured not only by weapons our troops carry, but by the languages they speak and the cultures that they understand"



SPEECH-TO-SPEECH



Text-to-Text





Speech-to-Speech (S2S)

Raytheon Iraqi
BBN Technologies

You: Hello how are you doing



هو : مر حبا شلونك



Sleep 



Text-to-Text (T2T)

SDL T2T UI Demo 0.1

File View Tools Help

Translate

New Translation Document Queue Document View

بدأ في جدة اجتماع وزراء خارجية منظمة التعاون الإسلامي، قبيل انطلاق قمة مكة المرتقبة غدا لزعماء العالم الإسلامي التي من المقرر أن تركز على الوضع في سوريا وعلى "المشكلات التي تعوق مسيرة العمل الإسلامي"، بحسب عيد الحزير بن عبد الله نائب وزير الخارجية السعودي. وفي كلمة له بالمناسبة، قال الأمين العام للمنظمة أكمل الدين إحسان أوغلو إن منظمة التعاون "تؤكد ضرورة الحفاظ على وحدة سوريا ووقف العنف ضد المدنيين فوراً".

وأضاف أوغلو أن خطورة ما يجري على مستوى العالم الإسلامي "يتطلب توحيد الجهود".

وجدد الأمين العام استنكار المنظمة لما تتعرض له أقلية الروهينغا المسلمة في ميانمار من سلب للحقوق وانتهاك للحرمان والحريات، مشيراً في هذا المضمار إلى حرمانها من حقوقها الأساسية في الجنسية، حيث تعتبرهم سلطات ميانمار "لاجئين" من بنغلاديش.

وعدد أوغلو عددا من الخطوات التي قامت بها المنظمة مؤخرا في سبيل نصرة أقلية الروهينغا، ومن ذلك الإشراف على اجتماع تنسيقي في العاصمة الماليزية كوالالمبور للجمعيات الخيرية والإغاثية لصالح مسلمي ميانمار، وإيفاد مبعوث من المنظمة إلى ميانمار التقى برئيسها، كما قام وفد من المنظمة بزيارة إقليم أركان، و"هي أول مرة نزر فيها هذا الإقليم".

وبحسب أوغلو فإن منظمة التعاون تعمل الآن على توقيع اتفاق مع حكومة ميانمار يسمح بوجود دائم للمنظمة في إقليم أركان.

In Jeddah began a meeting of foreign ministers of the Organization of [Islamic cooperation](#), such as the launching of Mecca summit expected tomorrow of the leaders of the Islamic world, which is expected to focus on the situation in Syria, and on "problems that impede the process of Islamic work", according to Abdul Aziz bin Abdullah, Deputy Saudi foreign minister.

In his speech, he said the secretary-general of the Organization Ekmeleddin Ihsanoglu, the organization of cooperation, "stresses the need to preserve the unity of Syria and stop violence against civilians immediately."

Cakmakoglu added that the seriousness of what is happening on the level of the Islamic world, "requires the consolidation of efforts."

The Secretary-General renewed condemnation of the Organization to [Rohingya](#) Muslim minority in Myanmar of robbery and the violation of rights and freedoms sacrilegious, referring in this regard to deprive them of their fundamental rights in nationality, where it considers the Myanmar authorities "refugees" from Bangladesh.

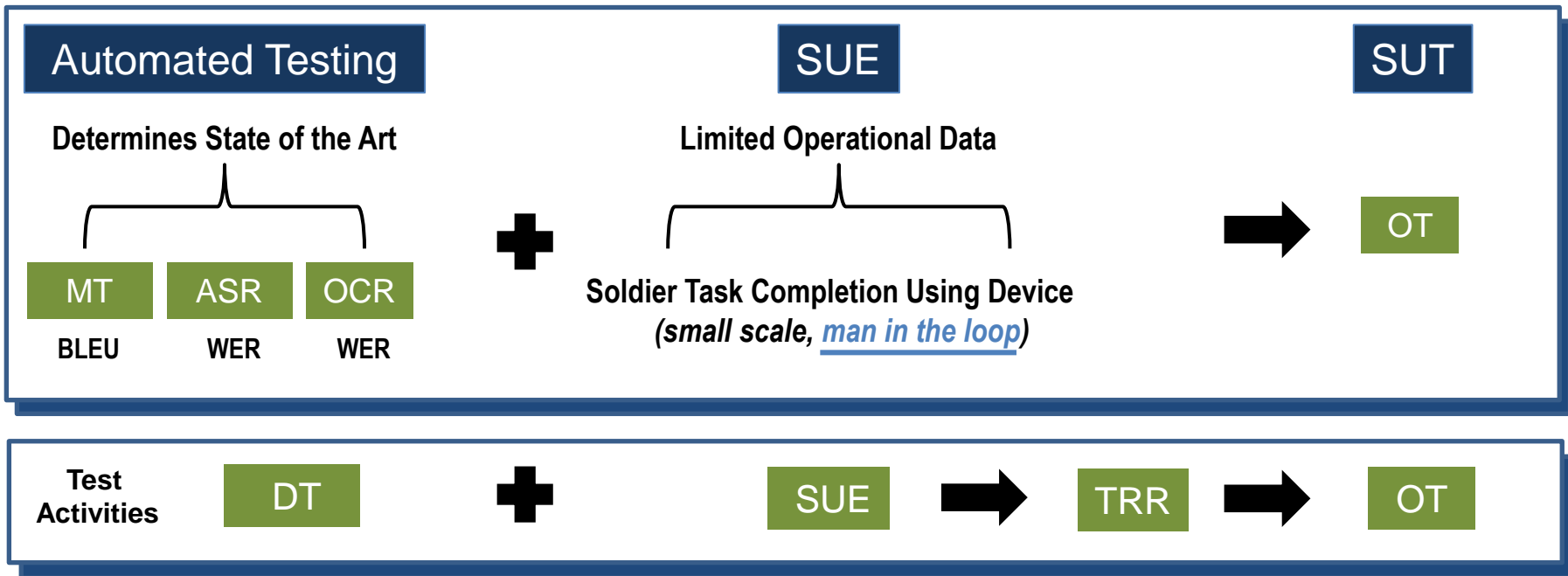
The number of Ihsanoglu a number of the steps taken by

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Open Issues

➤ Metrics



1. $ILR^* \approx ILR + (\text{Definition of Applicability of Machine Translation})$

2. Manual Protocol for Evaluating ILR^*

- Soldier knows how to do job
- Soldier knows how to use machine



Manual Scoring Protocol
(Developed)

3. Automated Metric Which Correlates to ILR

... **Poor Correlation**

ASR = Automatic Speech Recognition
BLEU = Bilingual Evaluation Understudy
DT = Developmental Testing
ILR = Interagency Language Roundtable
MT = Machine Translation
OCR = Optical Character Recognition
OT = Operational Testing
SUE = System Under Evaluation
SUT = System Under Test
TRR = Test Readiness Review
WER = Word Error Rate



Open Issues (continue)

➤ Data Collection

- Expensive
- Time Consuming
- Need Industry / Academia / S&T / Community Collaboration

➤ Domain Development

- Expensive
- Time Consuming
- Need Industry / Academia / S&T / Community Collaboration



Conclusions

➤ Initial Capability

- On schedule, within budget and performance parameters
- Need Industry / Academia / S&T / Community Collaboration with Open

Issue:

- Metrics

➤ Follow-on Capability

- Need Industry / Academia / S&T / Community Collaboration with Open

Issues:

- Metrics
- Data Collection
- Domain Development