MARINE

Machine Assisted Requirements INspection and Evaluation

Prepared for:

INCOSE New England Chapter

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Agenda

- About Logapps LLC
- Case Study
- What is MARINE?
- Demo

About Logapps LLC

- Founded in 2007, Logapps LLC is a Veteran-Owned Small Business (VOSB) located in Falls Church, Virginia.
- Senior principals bring many years of experience in: Cost Estimating, Economic Analysis, Systems Engineering, Program and Procurement Planning, Acquisition Strategy
- Extensive network of independent consultants and partners at hand to extend depth of Subject Matter Expertise
- Our clients are

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Human vs MARINE

CASE STUDY

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Case Study: Judiciary Cash Register (JACR) System

Logapps assisted the program in the collection and analysis of requirements

- **Received over 1000 requirements for the solution**
- **Identified and removed duplicates (from the text aspects only**
- **Determined Function Point SLOC Count: 238,076**
- **Applied manual functional analysis**

Manual functional analysis determined that requirements came from two legacy systems, and that documented requirements did not address client needs:

- Identified 67 unique functions
- Identified 28 unique interfaces
- Identified 75 unique reports

- Parametric analysis of the findings dropped the Function Point SLOC count to 95,506, which is less than half of the first software sizing; it also highlighted the weakness of the requirements document.
- The effort took about 100 hours to be completed.
- **If the FPA Tool were available at the time, it would have been able to import all the requirements and analyze them within minutes.**

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Manual FPA Example

Logapps collected and analyzed requirements for a Cash Register System at the request of the Judiciary

- **Received over 1000 requirements for the solution, then it was shorten to 840**
- **Identified and removed duplicate requirements**
- **Calculated Function Point Count: 1,802**

Manually identified:

- 67 unique functions
- 28 unique interface
- 75 unique reports

The effort took about 100 hours to be completed

How can we automate the process?

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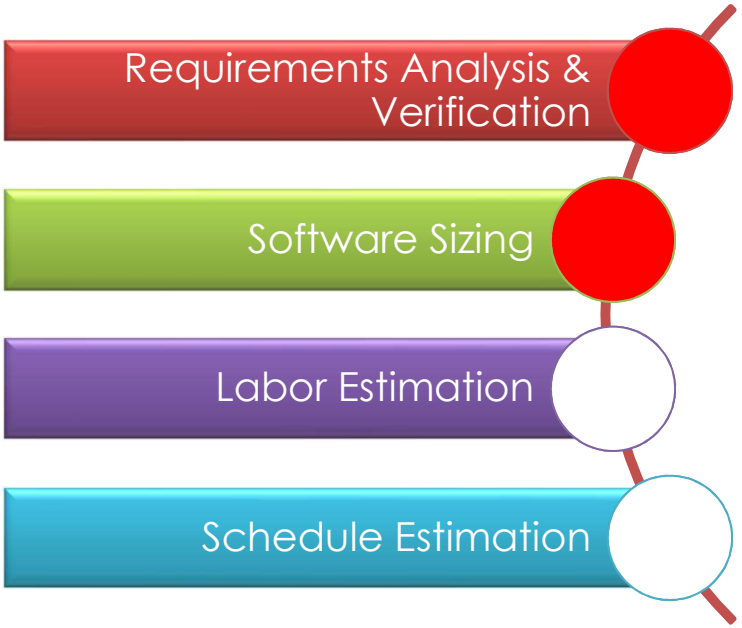
FPA Example (Cont.) Human vs. MARINE

	Human	MARINE	Comments
Number of Requirements	840	840	
Identified Duplicates	21	30	Higher than 95% (27 100%)
Similarities	0	50	Greater than 80%, and less than 95%
Identified unique features/ reports/entities	170	88	With some analyst input
Estimated Function Point Count / Source lines of Code	1802 / 95,506	1309 / 69,377	Effected by the analyst review (10 minutes)
Time	100 hrs	1147 seconds (~19 minutes)	

What is MARINE?

MARINE is a desktop application developed by LOGAPPS to review software requirements and estimate the cost of functional software size.



- **Analyze and validate requirements**
- **Perform function point count according to industry standards**
- **Produce ROM labor estimates**
- **Produce ROM schedule estimates**

The current version is developed around a core NLP capability and a robust rules engine

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Requirements Analysis

Inspects requirements for linguistic vagueness or ambiguity

- Segments or sentences that fail to produce a complete thought
- Dual use words which can lead to multiple interpretations

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Software Sizing

- MARINE uses Function Point Analysis (FPA) to produce a software size.
  - FPA counts a given system's functionality delivered to its users based on the user's view of the functional requirements (irrespective of technical implementation, language, or architecture)
  - FPA is governed by the International Function Point Users Group (IFPUG) ISO/IEC 20926
- Manual FPA can be tedious, time-consuming, and error-prone
- Persons with FPA expertise are difficult to attract and retain

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Natural Language Processing

Natural Language Processing Enables Faster and Deeper FPA

Automating Previously Human-Dependent Functions

- Natural Language Processing (NLP) enables computers to derive meaning from human or natural language input

Cutting-Edge Technology, Getting Smarter by the Day

- NLP has made dramatic strides in the last decade with new tools and extensive research

Wide Use Across Government and Industry

- Industries using NLP technology – defense intelligence, legal, healthcare

✓ Requirements are excellent subjects for NLP analysis because they have a semi-structured construct

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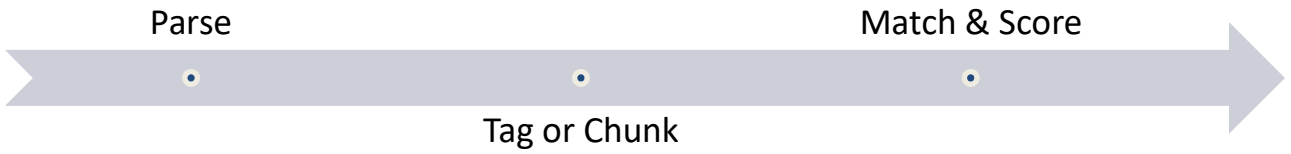
NLP in MARINE

Natural Language Processing – Requirement Example

#3.2 System shall update the Masterfile based on XXX calculations.

Req. #	Subject (noun)	Verb	Object (noun)	Prepositional phrase
3.2	System	shall update	Masterfile	based on XXX calculations

Req. #	Key Verb	Other Verb	Proper Noun	Noun	Subject	Object	Verb Phrase
3.2	update	based	System, Masterfile, XXX	calculations	System	Masterfile, XXX, calculations	update the Masterfile based on XXX calculations



✓ **Requirements** and **User Stories** are excellent subjects for NLP analysis because they have a semi-structured construct

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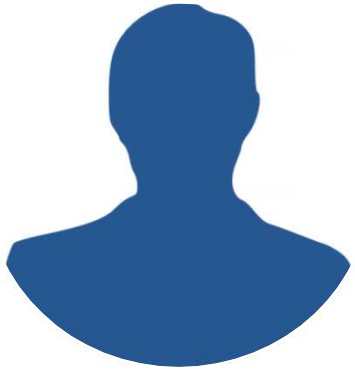
Who Benefits?



Requirements Analyst

Cost Estimator

Project Manager

MAN vs. MACHINE: MARINE decreases experts' time spent and reduces risks associated with human error and subjectivity

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Demo

[Switch to the tool]

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Contact Us!

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OUR TEAM

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