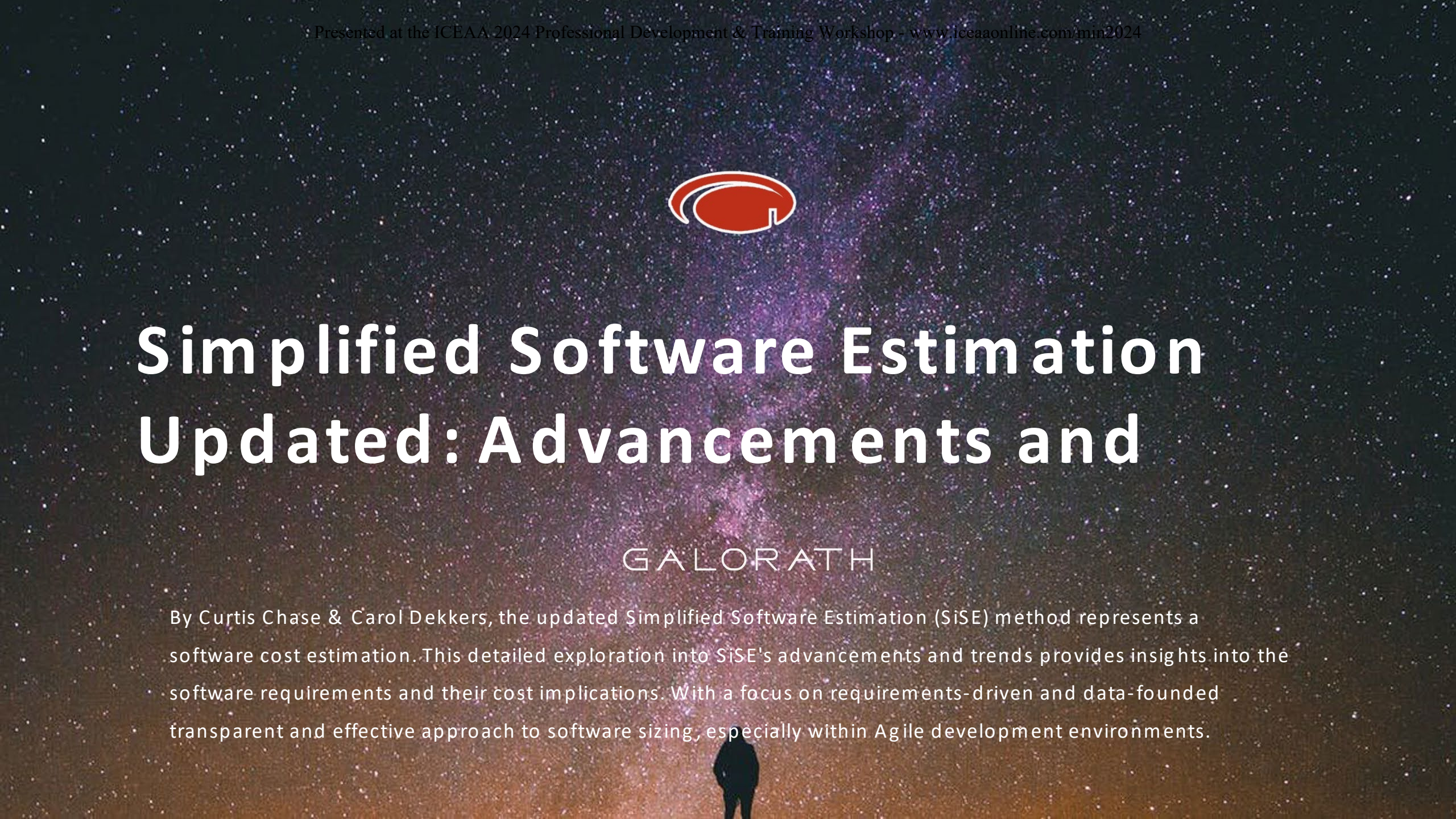

Simplified Software Estimation Updated: Advancements and

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By Curtis Chase & Carol Dekkers, the updated Simplified Software Estimation (SiSE) method represents a software cost estimation. This detailed exploration into SiSE's advancements and trends provides insights into the software requirements and their cost implications. With a focus on requirements-driven and data-founded transparent and effective approach to software sizing, especially within Agile development environments.

Understanding Software Estimation Challenges

1

Intangible Nature

Software's intangible nature complicates the standardization of requirements, posing a challenge for sizing and cost estimation.

2

Historical Data

Comparing against historical data is difficult without standardized articulation of software requirements.

3

Demand & Supply

Currently the demand for requirements-driven and data-founded software estimates outweighs the supply.

Function Point Analysis (FPA)

Quantifying Software Size

FPA measures software size by quantifying standardized inputs, outputs, queries, internal and external files.

IFPUG Standards

The International Function Point Users Group maintains standards for FPA and certifies analysts through rigorous training and testing.

Accuracy vs. Limitations

While FPA provides accurate measurements, it has limitations, especially for early software requirements with unknown details. Currently, there are fewer than 1,100 certified analysts worldwide and under 100 in the US.

Simplified Software Estimation (SiSE)

Approach to Software Sizing

1. **Action Verbs List**

   Create a list of action verbs to decompose into weighted components based on the SFP method.

2. **Estimate Program Size**

   Match action verbs from software requirements to their weighted SFP values to estimate program size.

3. **Uncertainty Review**

   Review for uncertainties in sizing and provide a range with justification for each requirement.

4. **Sum and Adjust**

   Sum the values and apply historical growth factors to the estimates.

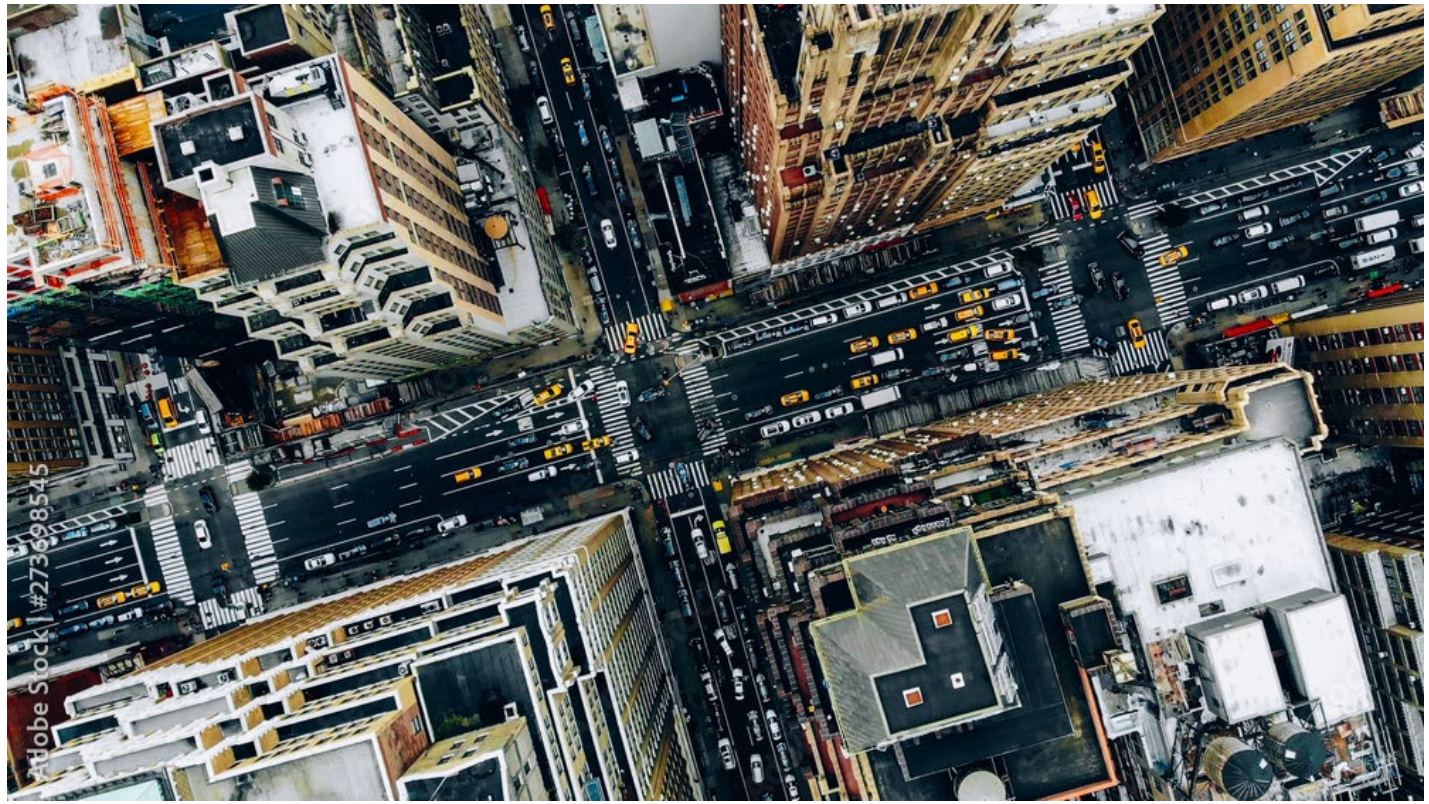
5. **Validate Estimates**

   Review the final size estimate for consistency and compare with prior estimates as a cross-check.

SiSE Example: AlertHub

AlertHub: Your Personalized Notification Platform

- In a bustling city, where every moment counts, a team of tech enthusiast created AlertHub, a revolutionary software product designed to keep citizens informed and empowered.



SiSE Example: AlertHub

Tailored to Your Needs

AlertHub allows users to customize their notification preferences, ensuring they alerts that are truly relevant to their daily lives. Whether it's traffic updates for the commute or weather forecasts weekend plans, the platform delivers timely, personalized information to keep users informed and prepared.

Seamless Integration

With just a few clicks, users can effortlessly set up their AlertHub account and start receiving notifications via email or directly on their smartphones. The platform's user-friendly interface makes it easy to manage user accounts.

Trusted Security

AlertHub prioritizes user and data security, robust encryption protocols safeguard sensitive
Users can trust that their data is protected, allowing to focus on staying informed without worrying about their digital footprint.

SiSE Example: AlertHub

Results

Curtis (Novice)

- Number of requirements = 5
- Number of functional requirements = 5
- Number of non-functional requirements = 0
- **Number of SFP = 67**

PROGRAM NAME:	AlertHub	1. SFP Requirements Estimate Sheet
NAME OF ANALYST/ESTIMATOR:	Curtis Chase	
DATE:	5/14/2024	

Program Software Requirements (Number and Description):		Free format comment column. Examples:	Enter Action	SFP Generated Results (Most Likely)	
NUMBER	REQUIREMENT DESCRIPTION	Non Functional Requirement?	Verb 1	SFP (1)	Cumulative SFPs
1	set up their AlertHub account		*create*	0.0	0.0
2	start receiving notifications via email		*notify*	4.6	4.6
3	receiving notifications via smartphone		notify	4.6	9.2
4	manage user accounts		manage	25.4	34.6
5	Implement robust encryption protocols, access controls, and governance policies		create	0.0	34.6
				0.0	34.6

Carol (Expert)

- Number of requirements = 5
- Number of functional requirements = 3
- Number of non-functional requirements = 1
  - “Implementing robust encryption protocols”
  - Security measurements are non-functional
- Number of duplicates = 1
  - “set up their AlertHub account”
  - “Manage user accounts” encompasses “set up their AlertHub account”
- **Number of SFP = 34.6**

PROGRAM NAME:	AlertHub	1. SFP Requirements Estimate Sheet
NAME OF ANALYST/ESTIMATOR:	Carol Dekkers	
DATE:	5/14/2024	

Program Software Requirements (Number and Description):		Free format comment column. Examples:	Enter Action	SFP Generated Results (Most Likely)	
NUMBER	REQUIREMENT DESCRIPTION	Non Functional Requirement?	Verb 1	SFP (1)	Cumulative SFPs
1	set up their AlertHub account *** NOTE that this requirement is a subset of the overall functionality of Maintain, therefore is not counted explicitly in this row.	NSP (Not a standalone process) - this is a subset of the overall functionality of MAINTAIN (create, read, update, delete: CRUD + datastore) as outlined in requirement #4 below		0.0	0.0
2	start receiving notifications via email		Notify	4.6	4.6
3	receiving notifications via smartphone		Notify	4.6	9.2
4	manage user accounts	Maintain is Create, Read, Update, Delete (CRUD) + data store	Manage	25.4	34.6
5	Implement robust encryption protocols, access controls, and governance policies	NFR (Non functional requirement) - security measures to manage…		0.0	34.6
				0.0	34.6

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SiSE's Impact on Software Cost Estimating

1

Early Estimates

SiSE provides early estimates of software size, delineating the weighted value of implied functionality.

2

Defensible Estimates

The estimates are defensible and serve as a quantifiable baseline for further cost estimation.

3

Supporting Program Monitoring

SiSE size estimates support ongoing progress reporting and analysis of alternatives.

Key Findings and SiSE Updates

1

Verb Keyword Lexicon

The lexicon has been expanded to increase the consistency of action verbs used in SiSE.

2

Uncertainty Inclusion

SiSE now includes uncertainty on a requirement-by-requirement basis, enhancing the method's accuracy.

3

SiSE Template

An MS Excel® template was developed to automate the conversion of action verbs into SFP values and record estimates.

Assessing Uncertainty

1. **Is the chosen action verb appropriate?**
2. **Is this requirement a duplicate of another requirement?**
3. **Is this a partial requirement?**
4. **Could this requirement be interpreted differently?**

SiSE Uncertainty Example: AlertHub

- Previous Requirements:
  - **Set up** AlertHub account
  - Receiving notifications **(notify)** via email
  - Receiving notifications **(notify)** via smartphone
  - **Manage** user accounts
  - **Implement** robust encryption protocols
- Potential requirement ambiguity
  - Receiving notifications via smartphone, potential channels:
    - Push Notifications
    - In-App Notifications
    - SMS (Short Message Service)
    - Email Notifications
    - Mobile App Alerts

SiSE Uncertainty Example: AlertHub

- Uncertainty Assumption:
  - Each notification channel can be interpreted as a standalone requirement
  - We will not include email as a potential channel for requirement #3 because it is included in the count for requirement #2
  - Therefore, a high factor of six is applied against the SFP count for requirement #3
    - 4.6 SFP * 6 = 27.6 SFP

Program Software Requirements (Number and Description):			Enter Action		VERB UNCERTAINTY (Entered verb(s) = Most Likely. Comment should explain rationale for Low and High Factors. If there is no uncertainty, use 1 for both Low and High.						
NUMBER	REQUIREMENT DESCRIPTION		Verb 1		UNCERTAINTY EXPLANATIONS	LOW FACTOR	HIGH FACTOR	LOW SFP = Col L * Col O)	Cumulative LOW SFPs	HIGH SFP = Col L * Col P	Cumulative HIGH SFPs
1	set up their AlertHub account		*create*			*1*	*1*	0.0	0.0	0.0	0.0
2	start receiving notifications via email		*notify*			*1*	*1*	4.6	4.6	4.6	4.6
3	receiving notifications via smartphone		notify		*Unsure if this is via one channel or all seven potential channels (e.g., Push Notifications, SMS, etc.) remembering email (mentioned above) is one. Low factor = 1, high factor = 6*	*1*	*6*	4.6	9.2	27.6	32.2
4	manage user accounts		manage			1	1	25.4	34.6	25.4	57.6
5	Implement robust encryption protocols, access controls, and governance policies		create			1	1	0.0	34.6	0.0	57.6
								0.0	34.6	0.0	57.6

SiSE Template Enhancements

Automated Record

The SiSE template in MS Excel® format provides an automated record of the software sizing estimate.

Data Entry Tabs

Includes data entry tabs for detailed requirements, interface requirements, and progress reporting.

Keyword Lexicon

The protected keyword lexicon spreadsheet has been expanded to include more action verbs and synonyms.

Turning SiSE Estimates into Cost and Schedule Estimates

Software Size Estimates

Over 20 software development efforts at DHS CAD have been sized using SiSE from 2019 to 2024.

Requirements Maturity

Various documents such as ConOps, FRDs, and JIRA user stories are used depending on the software requirements' maturity.

Applying to Models

SiSE size estimates are applied to CAD's Cost Estimating Relationship (CER) and Schedule Estimating Relationship (SER) factors.

Lessons Learned from SiSE Implementation

1 Ambiguity and Uncertainty

Early software requirements often lack specificity, increasing sizing uncertainty.

2 Document Issues

Issues with ConOps and other documents can affect software sizing due to repetitiveness and inconsistencies.

3 JIRA User Stories

JIRA-level user stories may include non-functional tasks, requiring careful analysis to identify functional requirements.

Conclusion: The Advantages of SiSE

SiSE stands out as an ideal method for estimating Agile software size by:

- Adeptly converting action verbs from high-level requirements into Simple Function Points
- Allowing analysts to review and confirm the size of each requirement, applying uncertainty growth factors where necessary
- Allowing for the application of global growth factors to the overall size estimate, bolstering the confidence in the SiSE estimate.

As a result, SiSE has become a cornerstone in the realm of software cost estimation, particularly within the Department of Homeland Security's Cost Analysis Division.

We look forward to being part of your success

The Future. Delivered.

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