COMET Data Collection System Agile Development

Mangala Kuppa, Agile Certified Practitioner
Office of Technology and Survey Processing

Matt Burgess, Economist
Current Employment Statistics

FedCASIC 2013

BLS

Current Employment Statistics (CES) Survey

- Monthly survey of establishments

- The survey provides employment, hours, and earnings estimates based on payroll records of business establishments.

- Employment Situation News Release
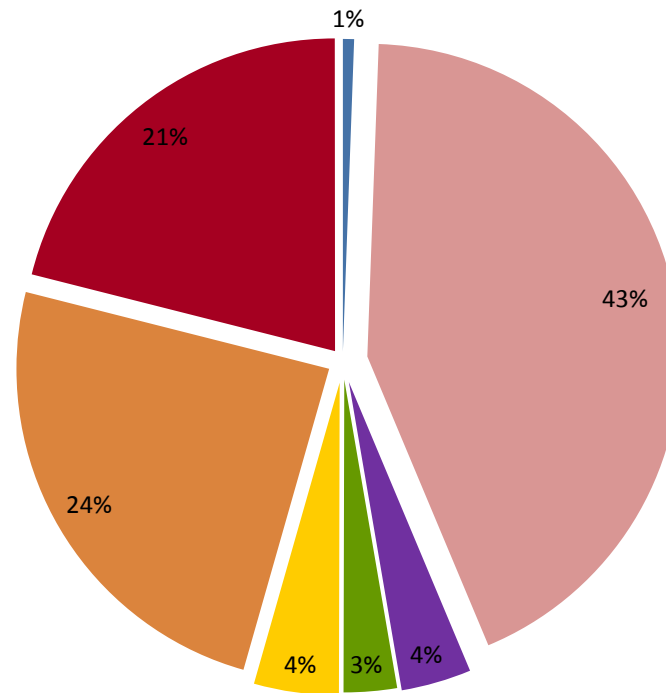
CES Facts

- Oldest Fed/State survey in the country
  - ▶ 1949: signed cooperative agreements with all 48 states and D.C.

- Largest multi-modal survey
  - ▶ Sample of ~ 145,000 (n) business and government agencies
  - ▶ 557,000 individual worksites

BLS

Collection Modes

- CES uses multiple collection modes in order to reduce respondent burden

  - **EDI (Electronic Data Interchange)**
  - CATI (Computer Assisted Telephone Interview)
  - TDE (Touch-tone Data Entry
  - Mail/Fax
  - Web
  - Special Arrangement

CES Sample by Collection Mode

Reports Collected

Legend:
- Mail
- EDI
- TDE
- Transcript
- Fax
- Web
- CATI

Values shown: 1%, 43%, 4%, 3%, 4%, 24%, 21%

Electronic Data Interchange (EDI)

- **EDI: Electronic transfer of information from machine to machine.**
  - ▶ Chicago **EDI** Center
  - ▶ Reserved for larger firms
- Advantages
  - ▶ Low monthly costs
  - ▶ Reduce respondent burden
- Disadvantage
  - ▶ **The raw data comes in a format that cannot initially be used in estimation.**
  - ▶ Large start-up cost

COMET EDI Tool

- COMET (Collection of Monthly Employment Totals) is a web-based system developed by the Division of Federal/State Monthly Surveys (FSMS), Office of Technology and Survey Processing (OTSP).

- The system is used by the CES EDI personnel to process raw payroll data submitted electronically by national, multi-unit firms (The raw EDI data is not submitted in a format that can initially be used in CES estimations).

- The COMET system allows for raw data to be imported into the system, aggregated to individual units within a firm, edited and screened for errors, and then transmitted for use by CES analysts.
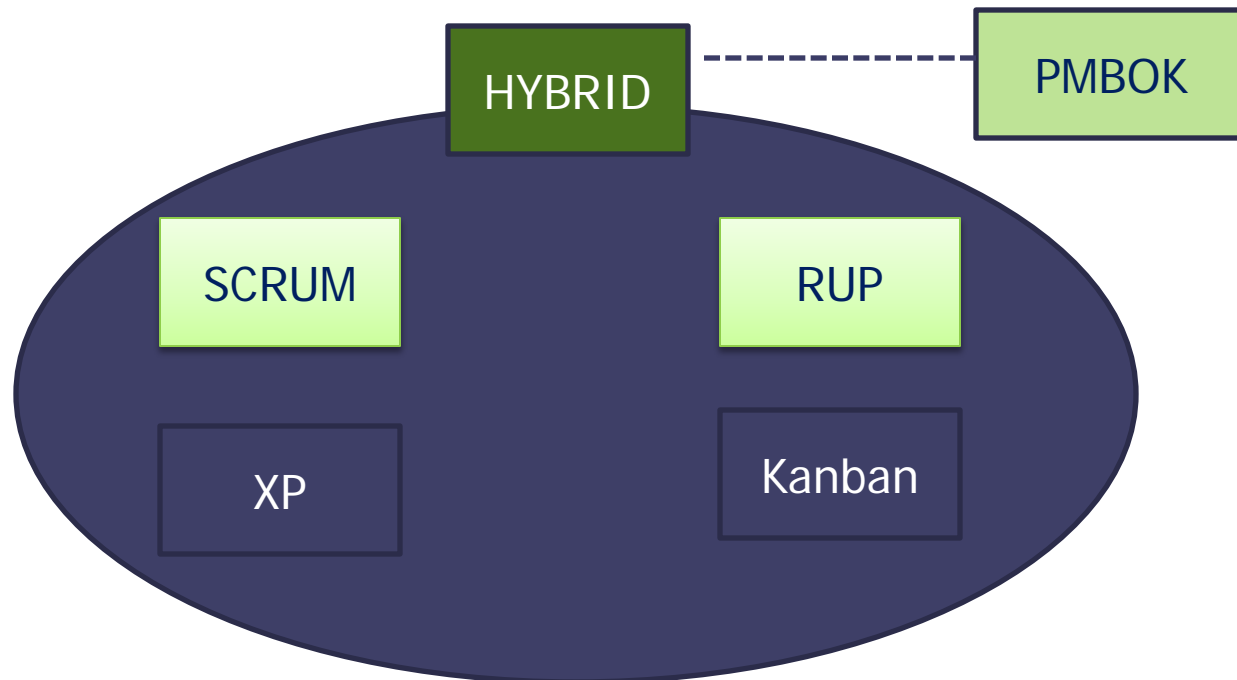
Agile Development Pilot

COMET project was selected for the following reasons:

▶ Re-engineering mitigates one of the significant risks in using outdated FoxPro technology

▶ Edison system was having issues and wanted to finish re-engineering by the end of FY 2012

▶ SME available on board, who coded the original Edison system

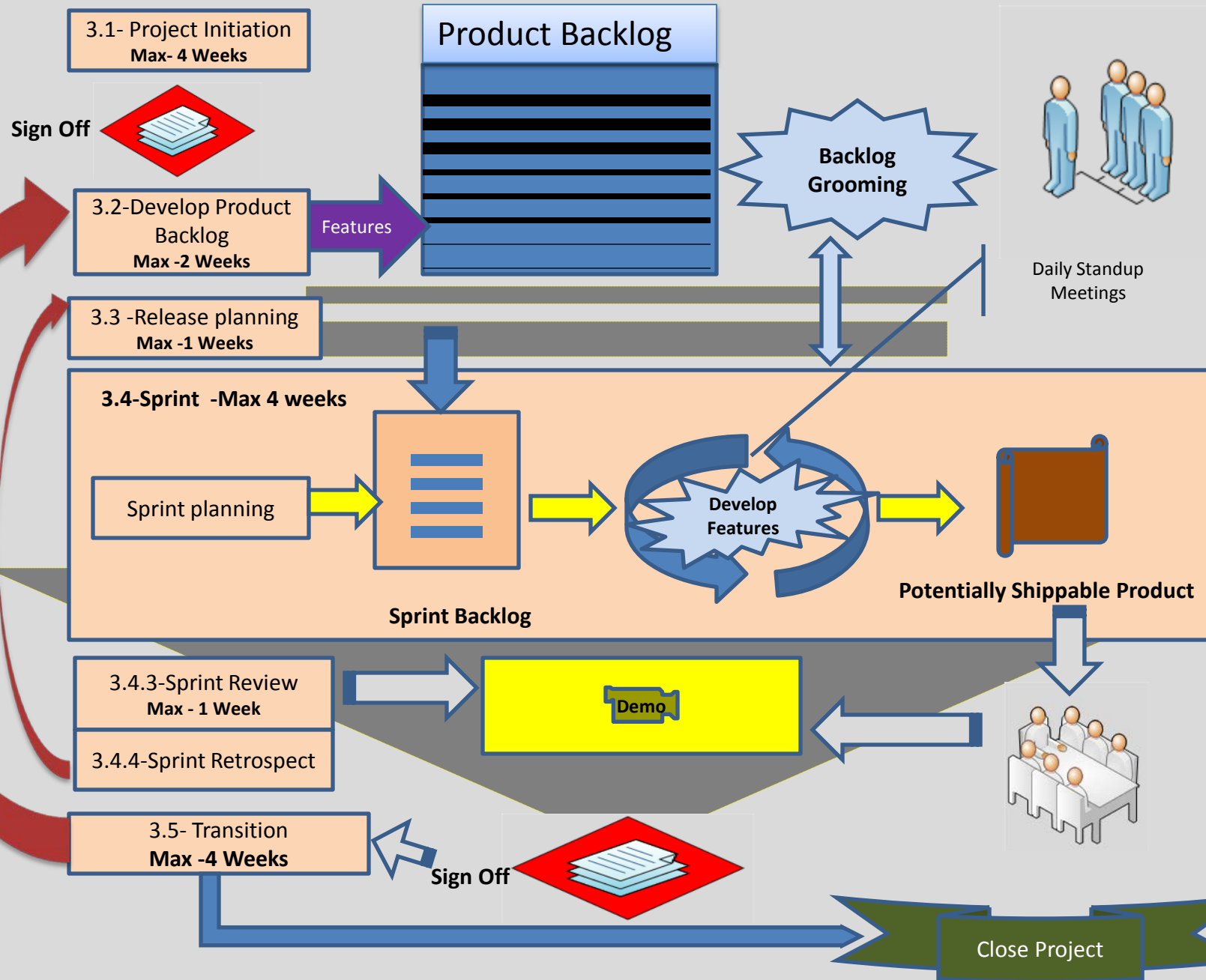▶ **Project will allow to try out agile principles in all phases of the SDLC**

BLS

COMET Agile Hybrid Process

- Hybrid Agile Process

FSMS followed hybrid methodology combining Scrum, XP, Kanban and best practices from RUP as well as PMBOK.
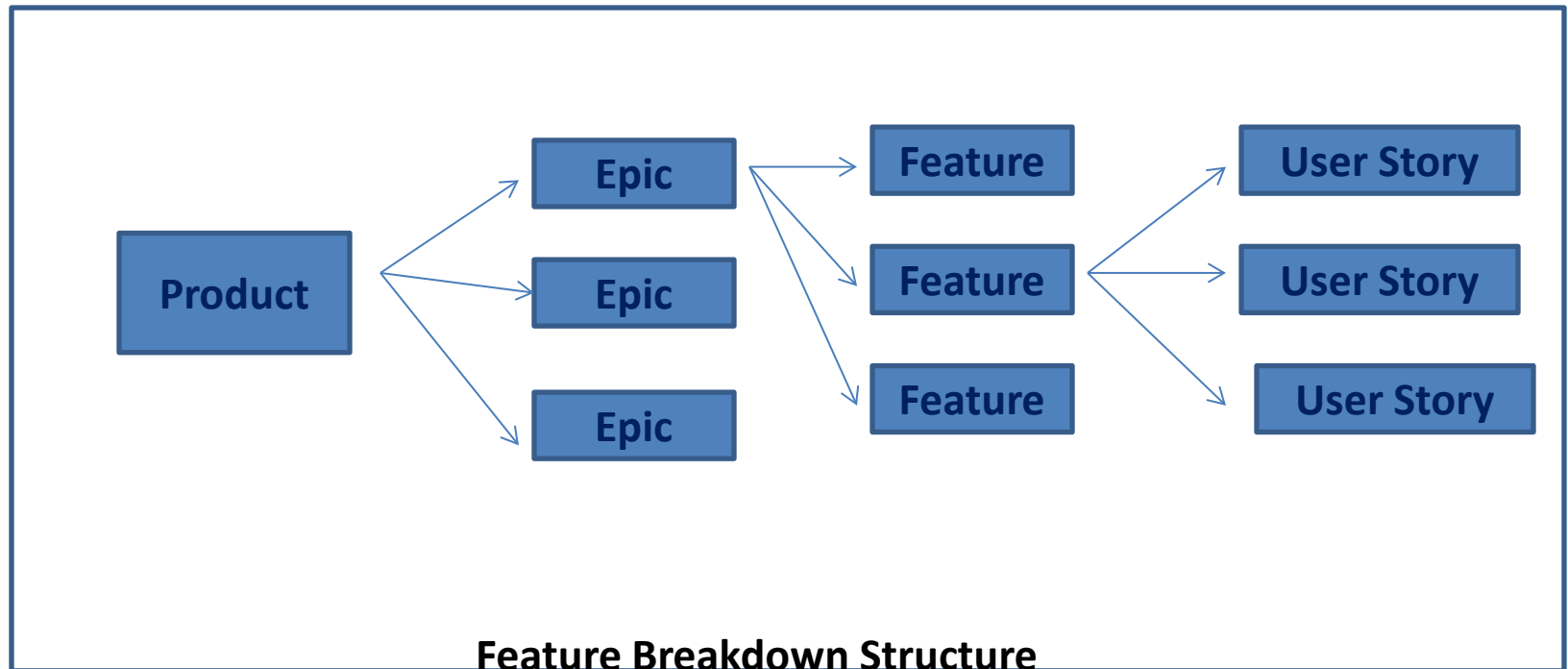
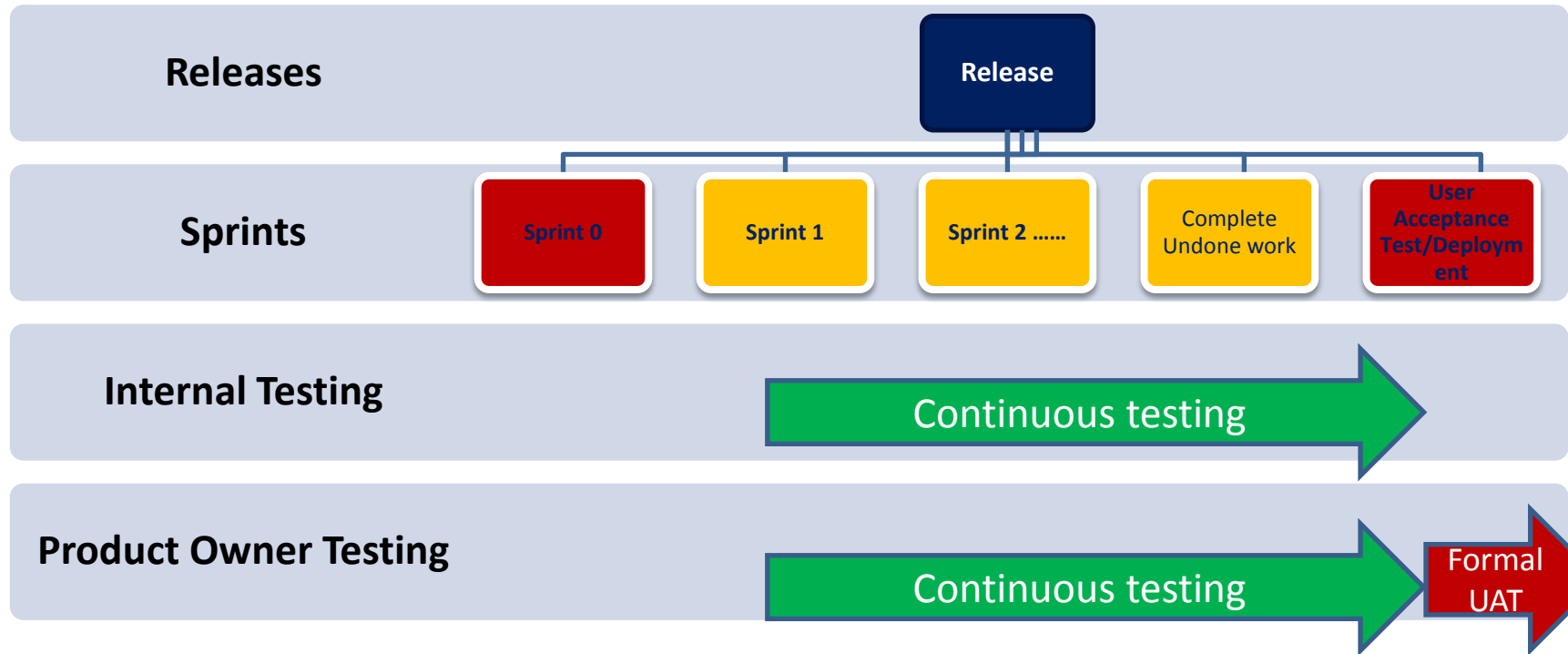# Tailored Agile Methodology used in COMET Development

3.1- Project Initiation
Max- 4 Weeks

Sign Off

Product Backlog

3.2-Develop Product Backlog
Max -2 Weeks

Features

Backlog Grooming

3.3 -Release planning
Max -1 Weeks

Daily Standup Meetings

3.4-Sprint -Max 4 weeks

Sprint planning

Develop Features

Potentially Shippable Product

Sprint Backlog

3.4.3-Sprint Review
Max - 1 Week

Demo

3.4.4-Sprint Retrospect

3.5- Transition
Max -4 Weeks

Sign Off

Close Project

Agile Product Backlog

- **Product Backlog Elements**

• The COMET team took one week to develop product backlog and to perform release planning.

• User story is used as a basis to discuss and further develop the story during the Sprint.

Feature Breakdown Structure

Testing in Agile Projects

Agile testing is performed throughout the development, even before code is written by way of automated test driven development.
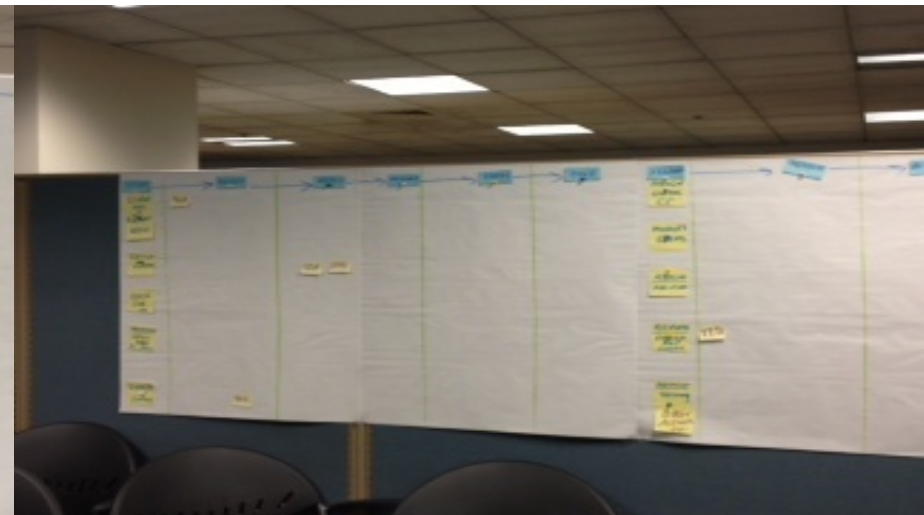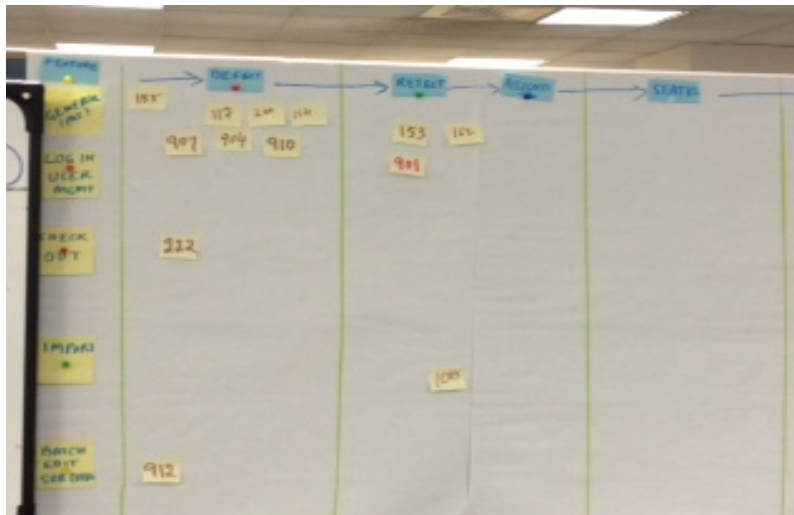
Releases			**Release**		
Sprints	Sprint 0	Sprint 1	Sprint 2 ……	Complete Undone work	User Acceptance Test/Deployment
Internal Testing			Continuous testing		
Product Owner Testing			Continuous testing		Formal UAT

Visualizing Defects

Defect/Change List

Contains both internal and external lists

New ▾ | Actions ▾ | Settings ▾

Test Type	Tester	Defect #	Title	Description/Test case	Steps	Expected Result	Actual Result	Final Status	Date Entered	Product ID	Sprint #	Date Assigned	Assigned To	Date Closed	Resolution	Notification Status
System Testing	FSMS	3	Add Firm not adding Firm name to Firms available for Check-out	A firm added through the Add Firm functionality should be displayed on the list of firms available for Check-out list.		The firm is available for checking out.	The firm is not being displayed on the Available Firms display.	Passed	5/7/2012	2.20, 1.10	1	5/7/2012	Amit			Notify - Closed
System Testing	FSMS	4	Check-out: disable the other selection options when one is chosen			firm.	display the Checked out firm.	Passed	5/7/2012		1	5/7/2012	Ganesh			Notify - Closed

COMET Development Dashboard Using SharePoint

COMET Agile Development Timeline

- **Timeline**
  - Start - February 21, 2012
  - Development Completion – September 28,2012
  - 7 Sprints including Sprint 0 (3 week sprints followed by 1 week review)

- **Production Rollout**
  - Parallel Production
    - Both Edison and COMET were used by Edi center to check results from real data
    - Month of October
  - Partial Production
    - Edi center used COMET for a portion of firms
    - November/December
  - Full Production
    - Edi center is using COMET for full production
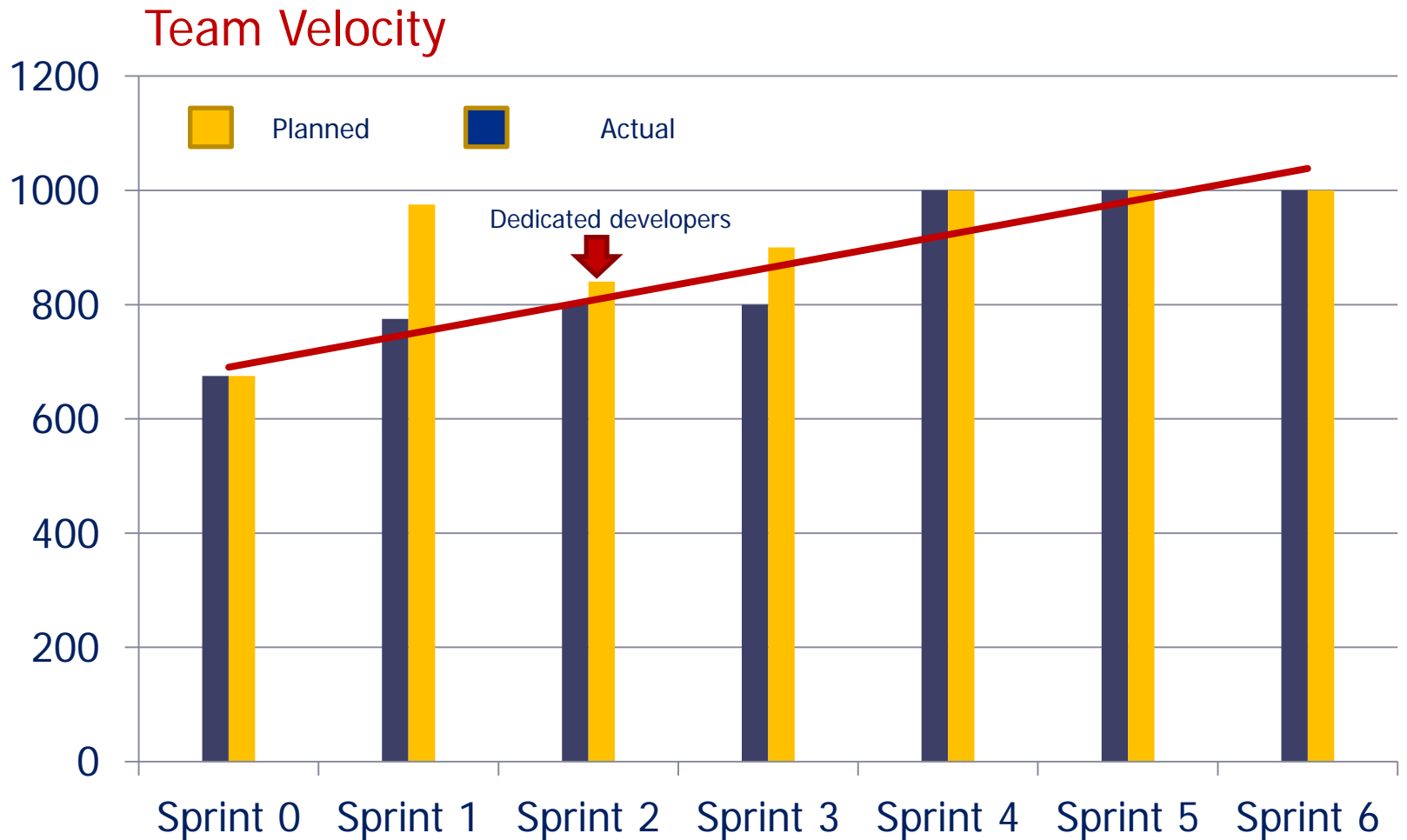   - December / January

BLS

COMET Architecture

- **Service Oriented Architecture (SOA)**
  - Login Web Service: SOA is leveraged in creating this web service with the intent to increase code reuse across heterogeneous application platforms.

- **Common Objects**
  - Implementation details are discussed on a daily basis to promote the use of common objects that can be shared across developers. Most of the common functions like database connectivity are coded as common modules for reuse.

- **Audit**
  - COMET has extensive audit feature that logs all changes to the data at a field level.

BLS

COMET Agile Development Deliverables

- **COMET Deliverables**
  - ✔ Product Backlog
  - ✔ Sprint Backlog
  - ✔ Burn Down Charts
  - ✔ Vision and Scope Document
  - ✔ Use Cases
  - ✔ Software Architecture Document
  - ✔ Risk List
  - ✔ Demo Each Sprint
  - ✔ SW Deployed for Chicago Feedback Each Sprint
  - ✔ **Status Reports**
  - ✔ **Migration List (Deployment Plan)**
  - ✔ **Defect List**
  - ✔ **Lessons Learned**
  - ✔ **Agile Methodology Document for DSP**

COMET Agile Development Team Velocity

Team Velocity

COMET Agile Development Results

- **Number of Issues Reported To Date**

  - **Major Show Stoppers : 0**
    - Bugs that affect the entire system and make it unusable

  - **Major: 0**
    - Bugs that affect a module and makes the module unusable

  - **Minor: Less than 12**
    - Bugs that affect a small portion of the system but do not disrupt usage of a feature/module

COMET Agile Development Results

- **Customer Feedback**

  - CES Program Office is very pleased with the results

  - EDI Center product owners really appreciate the ability to give input during development and pleased with the results

  - L3 users who got to use the system initially were concerned about training needs, but after 1 training session, quickly accepted the new system. (faster than expected)

BLS

COMET Look and Feel

Contact Information

Mangala Kuppa, Agile Certified Practitioner
Office of Technology and Survey Processing
202-691-5315
Kuppa.Mangala@bls.gov

Matt Burgess, Economist
Current Employment Statistics
202-691-6519
burgess.matthew@bls.gov