Contracting Case Studies

NDIA Agile in Government Summit

Digital Service Innovation Center

Pramod Malhotra. June 6th, 2018

SalientCRGT

Introduction

Presenter

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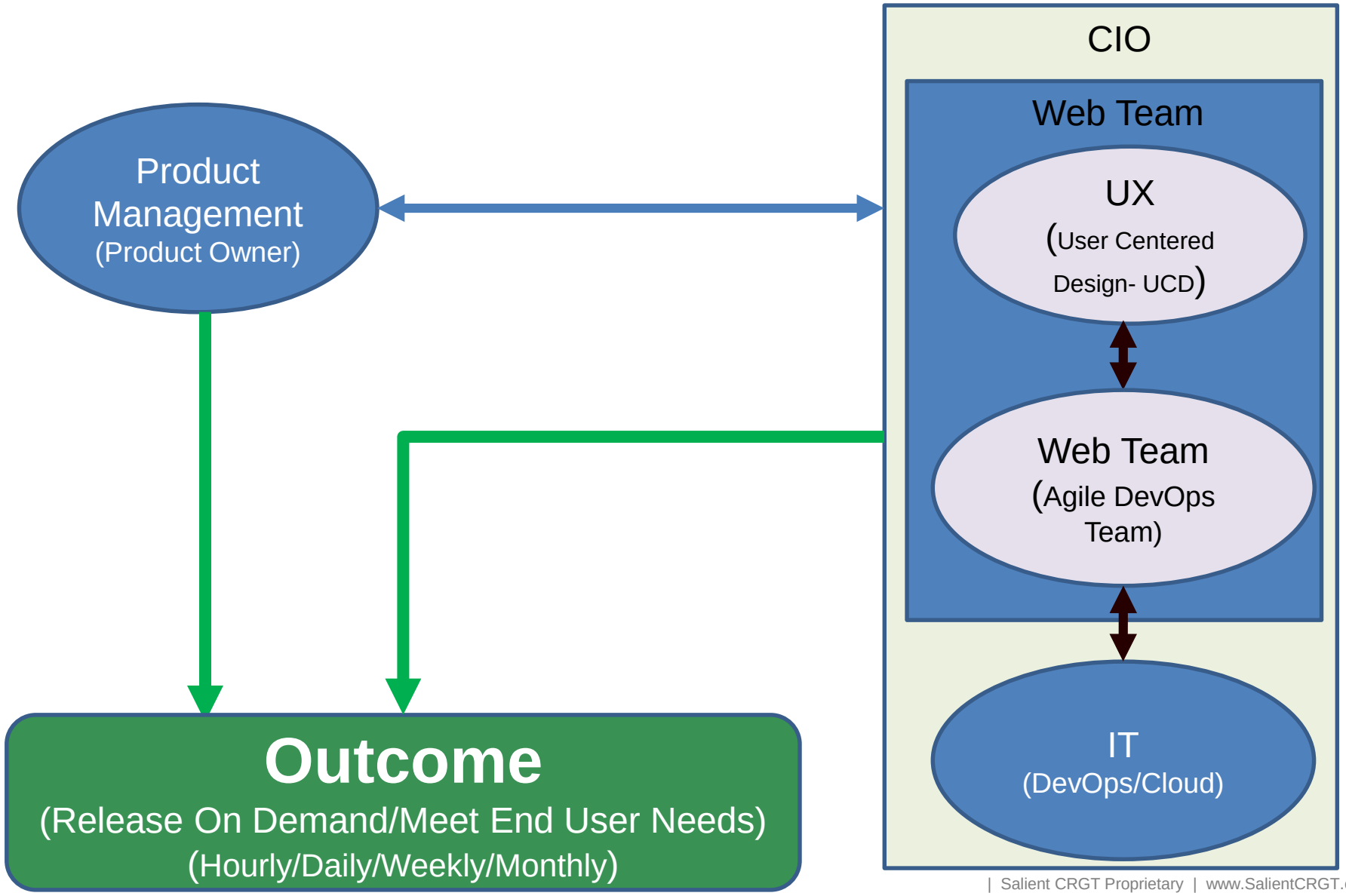
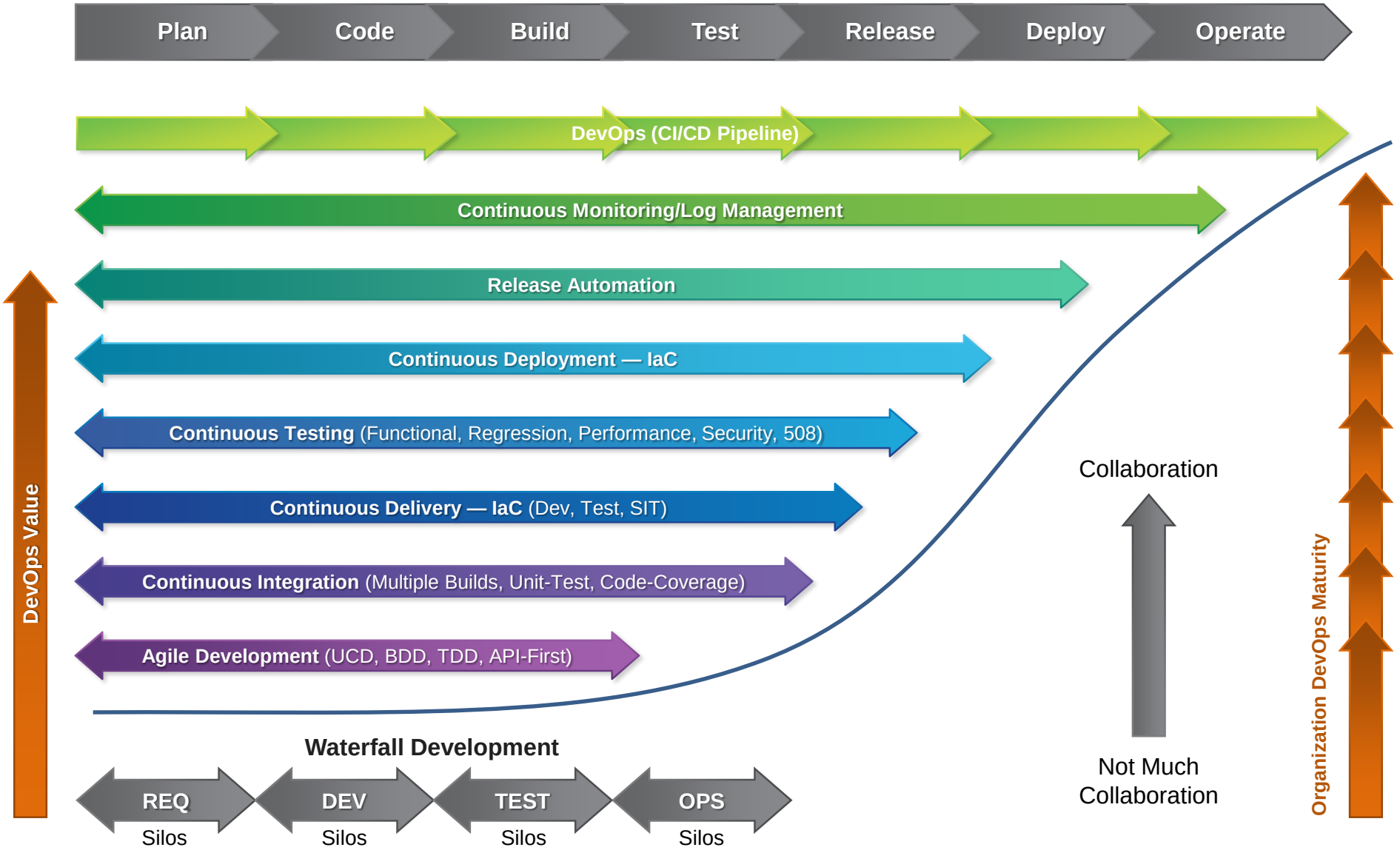
Companies	Experience
SalientCRGT Inc, Director	Government Services
Asurion Mobile Inc, Director	AT&T Security Mobile Applications
Adobe Inc, Director	Manage web team
Macromedia Inc, Director	Manage web team
Verizon, Director	Manage Verizon web ordering system

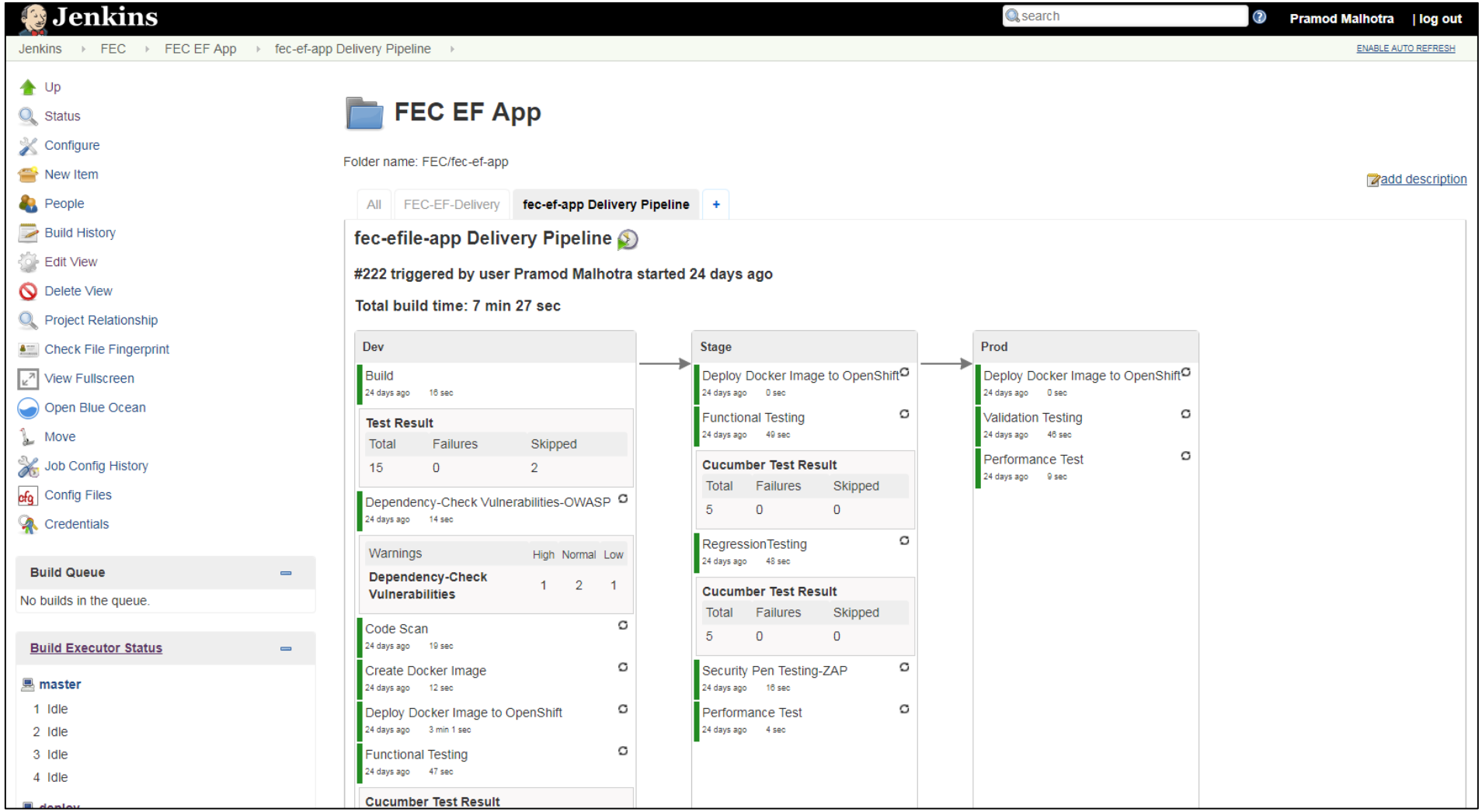
Adobe Web Team (2007)



DevOps Journey

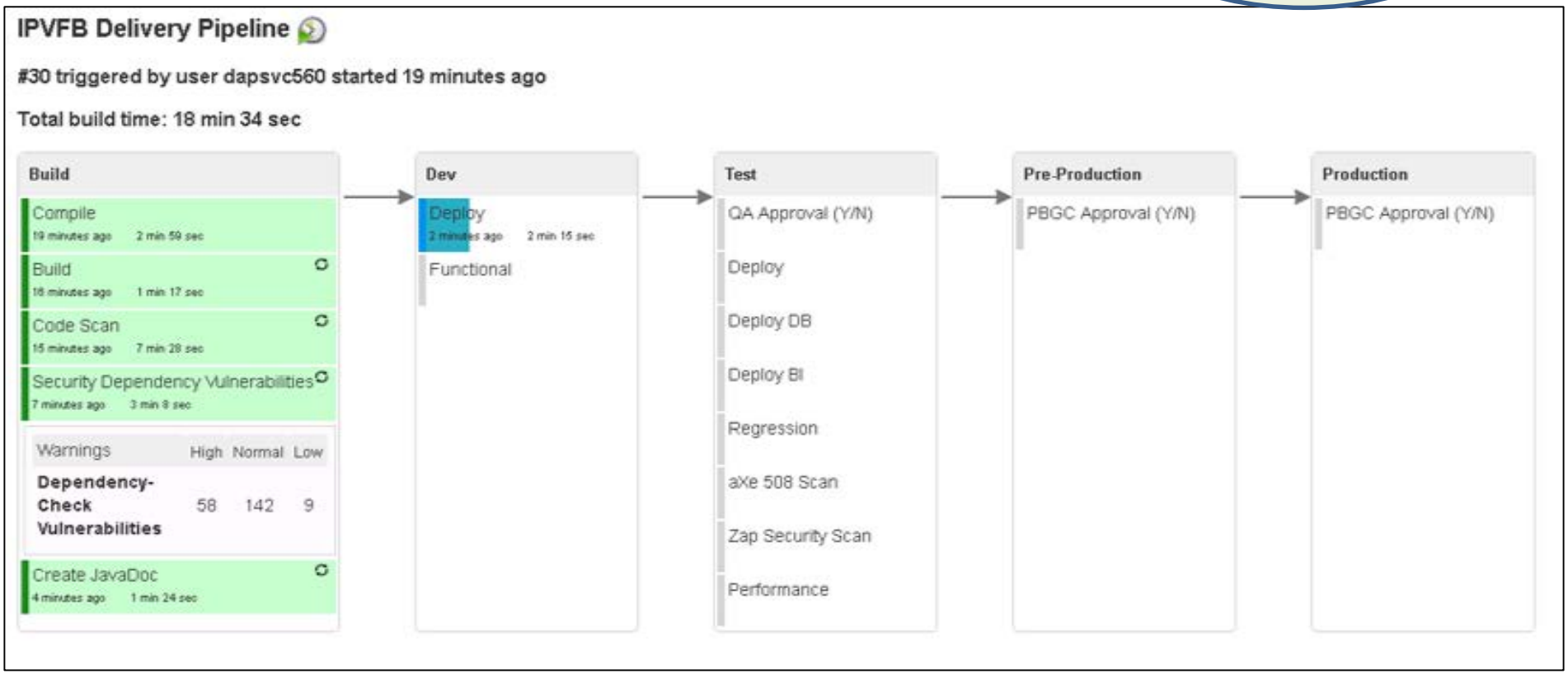


SCRGT DevOps CI/CD Pipeline



PBGC DevOps CI/CD Pipeline

Implemented in 2 Weeks!!



Purpose

1. Present new ideas on how Government Contracting can innovate to better implement Agile going forward:
   - Should Contracts be structure differently?
   - Who should be the Product Owner?
   - What drives application of Agile – the Proposal or RFP?

2. Present tips and lesson learned on how to successfully address agile within legacy contract mods and new contracts

3. Case studies for reviews, deliverables, and reporting to include EVM

Structure Contracts Differently

Should contracts for employing Agile methods be structured differently than those used in traditional waterfall process?

Understanding: What has changed?

- Traditionally government always wants to know, what they are buying, what it will cost and when it will be delivered.
- The essence of Agile, however, is adaptation and flexibility. Evolution and Iteration lead to discovery of more value.
- Agile projects are all about providing iterative business value. Agile projects should have value “completeness” lead by product owner and driven by the product backlog and frequently demonstrated by the vendor using working software.
- Agile projects need different metrics for determining success
- DevOps has revolutionized how projects get implemented and how iteratively value can be measured

Structure Contracts Differently ...cont. 2

Should contracts for employing Agile methods be structured differently than those used in traditional waterfall process?

Recommendation: Yes, they need to Shift:

1. From contract-centered to project-centered
   - ❑ Individuals and interactions over processes and tools
   - ❑ Working software over comprehensive documentation
   - ❑ Customer collaboration over contract negotiation
   - ❑ Responding to change over following a plan
2. From passive government ownership to active (e.g. waiting for vendor to complete something)
3. From buying software, to now entering a relationship
4. From “lump sum, fixed price” for a time period” to agile DevOps team pricing
5. From contract management to performance monitoring

Structure Contracts Differently ...cont. 3

Should contracts for employing Agile methods be structured differently than those used in traditional waterfall process?

Recommendation: Contracts should enforce and facilitate the following:

1. The contract should facilitate Agile process and incentivize vendors to deliver software that works
2. Prioritize success of the collaboration and regular demonstration of progress
3. Use competition to keep vendors eager to deliver software that works
4. Small, incremental contracts with ability to switch vendors after any iteration
5. Instead of trying to identify non-performance in terms of time, cost and scope, replace it with trust, close collaboration, frequent demonstration of working software and evaluation in Agile.
6. Trust, Verification and Competition ensures vendor deliver their best, and agency has the flexibility to hire more teams from higher performing vendors, and cut teams from lower or non-performing vendors
7. Monthly feedback is provided by agency on an ongoing basis, with detailed evaluation every 6 months.

- E.g. USCIS has implemented a new contract vehicle that allows them to hire Agile DevOps teams of size=9, and then monitor/verify there work through an internally created metrics driven process. It's a good starting model for other agencies to study.

Product Owner

Who Should be the Product Owner?

Understanding: The role of Product Owner

1. Product Owner (PO) is a challenging role whether implementing Agile in private or public.
2. While the PO role is the main role in most Agile projects, it may be even more challenging in the public sector.
3. Also in Government, the PO will have to battle an environment more rule bound.
4. 100% dedicated PO works on Agile project, part time invariably leads to problems.
5. Being agile-literate, understanding of agile methodologies and approaches is necessary.
6. Product Owners who understand users needs, understand what business value needs to be delivered in every iteration, is not an easily acquired skill, specially if you have had years of waterfall experience.
7. PO success is achievable only when there is 100% executive buy in and support for training, learning and empowering PO for making decisions.

Product Owner ...cont. 2

Who Should be the Product Owner?

Recommendation – Hybrid Product Owner

1. Expecting all agencies to have highly skilled dedicated PO for every project invariably runs into challenges..

2. With the advent of DevOps the need for understanding different DevOps practices/tools is putting additional load on PO's

3. With Shared responsibility and equal say and a goal to provide value to business, vendor PO and Government PO can work together to fill gap and ensure all responsibilities of PO are effectively executed without any delay.

4. This also helps the fatigue factor and also provides continuity on longer projects if PO has to leave for some reason.

5. Some agencies are providing dedicated PO's, for most agencies this would be a challenge but with training and experience they can eventually get there.

E.g. USCIS agency is providing PO's and RFPs want vendors to assume agency provided PO's and product backlog will be created and provided to teams.

Proposal or the RFP

What drives application of agile - the proposal or the RFP?

Understanding:

- We have enough example in government where Agile and DevOps have been implemented and metrics and verification processes for success defined.
- Further, with DevOps implementation, transparency has increased and it's much easier now to trust and verify vendor's performance iteratively.
- Most agencies are implementing their own DevOps pipeline and practices to follow, all vendors need to do is deliver business value demonstrated via working software using agencies Agile/DevOps practices.
- Also, agencies are providing dedicated Product Owners

Proposal or the RFP ...cont.2

What drives application of Agile – the proposal or RFP?

Recommendation: The RFP

The RFP should drive the application of Agile:

1. Agencies now have the maturity to specify, exactly the Agile and DevOps practices that they would like every vendor to follow.
2. Agencies now have the maturity to specify in the RFP, how Product Owners will be running the project, and vendors will be asked to provide Agile DevOps teams to deliver business value iteratively
3. Agencies now have the maturity to specify in the RFP, the transparency and verification that they would like for each vendor to demonstrate.
4. Agencies now have the maturity to specify in the RFP, the evaluation and feedback process that each vendor will get and go through

The Proposal should ensure:

1. How vendor will meet or exceeding the metrics for Agile implementation as suggested in the RFP
2. How vendor will collaborate and innovate over and above what's existing at the agency.
3. How vendor will meet and exceed evaluation criteria set in the RFP
4. How vendor pricing works for team composition desired by the RFP

Agile within Legacy/New contracts

Tips and lessons learned on how to successfully address agile within legacy contract mods, or new contracts

Legacy Contracts

- Use Hybrid-Agile Methodology
- Use Agile practices during the design phase.
- Use User Centered Design (UCD) practice, wireframing and prototyping to design the system and get end-user feedback without writing single-line of code
- Rest of the activities can still be done using Waterfall methodology
- Further DevOps Pipeline can be leveraged based on the existing technology stack, with DevOps you achieve automation and gain operation efficiencies, speed and breaking down of silos.
- Introducing automation, will remove redundancy and manual repeat work done on waterfall projects
- Test Automation is key to successfully implement delivery of features via agile methodology. With test automation quality baseline is created and change or new features can be developed and deployed iteratively.

Agile within Legacy/New contracts …cont.2

Tips and lessons learned on how to successfully address agile within legacy contract mods, or new contracts

New Contracts

- Use a well structured DevOps Pipeline from day-1
- Hire Vendor(s) who have experience implementing projects in a Agile DevOps environment
- Product Owner should have the necessary skills, else make sure you partner PO with a strong Product Owner from vendor team.
- Use retrospective meeting feedback to implement the necessary changed for creating high-performing team.
- Use prototyping tools that allow complete design and flow of the application done without writing any lines of code, this ensures the least re-work on agile projects.
- Do not short change on agile ceremonies, they are there for a reason
- Always focus effort and decision making of the team on delivering "value" for the customer.

Case Studies for Agile EVM

Case studies for reviews, deliverables, and reporting to include EVM

Understanding

- Earned Value Management (EVM) as it is popularly known, is primarily used for measuring project performance and to forecast project performance at the end of the project.

- At the heart of the EVM lies the concept that as the project progresses, value is being generated. This value, measured in $'s, normally called "Earned Value" or **EV**, can then be compared to the project's actual costs (**AC**) and planned value (**PV**) and this comparison process can assist in forecasting future project performance.

- Successful utilization of EVM is dependent on early determination of project baselines (such that BAC – Budgeted at Completion and PV – Planned Value are easily identified) as well as on the ability of the organization to record and retrieve actual progress made against the project and being able to report on actual costs incurred to make this progress happen.

- The core principle behind the agile movement was the realization that better value can be delivered faster, with more responsiveness and adaptation to changes, and maybe cheaper development without focusing on cost and upfront calculation of scope.

Case Studies for Agile EVM ...cont. 2

Case studies for reviews, deliverables, and reporting to include EVM

We can determine upfront for Agile projects:

- Baseline Velocity – This performance measurement is an indicator that reflects organization on-going and historical efficiency. New Agile projects often find this challenging, but with time most agile organization through constant review and monitoring have good idea of their baseline velocity.

- Project Scope - Determining total project scope does not go well with the underlying principles of the Agile, and is often seen as against agile tenants of adaptation to customer changing needs. Notwithstanding the above, some level of total scope quantification is required in order to integrate EVM measurements into the project delivery cycle. Teams use an Agile concept Scientific Wild Ass Guess (SWAG), if enough information is not available initially for story points.

- Cost Per Point – Having access to this information requires the organization to track it's development costs and cost of all supporting disciplines. Different techniques are available to calculate cost (Past experience, Developers cost + X%, Using Timesheets for more accurate numbers)

- Value Points – Forward looking Agile teams instead of worrying about cost, assign "Value Points" for each requirement (user story), and try to provide maximum value as early as possible to their business users.. They then can use it to calculate EV based on Value in addition to Cost

Case Studies for Agile EVM ...cont. 3

Incorporating Agile and EVM

We need these 4 pieces of information:

- **Product Backlog** in points – i.e. what is the total scope of development for this project, presented as a number of points.
- **Baseline Velocity** – i.e. a planned value of the total number of points planned to be delivered / complete during each Iteration (Sprint).
- **Cost Per Point** – An estimated cost for delivering a single Point. This would normally be based on past performance of the delivering organization.
- **Delivered Value** in points – Some Agile Team/PO in addition to user story points for estimating the work, also assign Value points. The goal of PO and Agile team is to provide maximum value to end-user with each iteration

Using the above parameters, two other planning measurements can be derived:

- **Budgeted At Completion** (BAC) – this is the product of multiplying the Product Backlog by the Cost Per Point. So, for example, if the total scope of work for the project is estimated at 1,000 points, and the historical Cost Per Point is $1,000, then the total estimated cost of the project is 1,000 x $1,000 = $1M.
- **Planned number of Iterations** – this can be derived from dividing the Product Backlog by the Baseline Velocity. For example, if the total scope of work for the project is estimated at 1,000 points, and the Baseline Velocity is 40 points per Iteration, then the planned number of Iterations is 1,000 / 40 = 25 Iterations.

Case Studies for Agile EVM ...cont. 4

Sprint 0 (Estimation)	Sprint 1 (Actual)
Estimations: • Product Backlog = **300** points • Baseline Velocity per Iteration = **30** • Cost per point = **$1500**	Actuals: • Actual Points Completed = 25 • Actual Cost = $32,000
Calculations: • Budget at Completion (300 x $1500) = **$450,000** • Planned # of Iteration (300 / 30) = **10** • Planned % Completion per Iteration (300 / 30) = **10%** • Planned Value per Iterations (10% x $450,000) **= $45,000**	Calculations: • Actual % Completion (AC=25/300) = **8.3%** • Earned Value (EV=8.3% x $450,000) **= $37,350** • Cost Performance Index (CPI) = EV/AC (37,500/32,000)= **1.17** • Scheduled Performance Index (SPI) = EV/PV (37,000/45,000) = **0.82**
	✓ The CPI is > 1 which implies that the value of the project's throughput is higher than the cost of production. ✓ The SPI is < 1 which implies that the value of the project's throughput is below the planned value. ✓ With current performance we'll be under budget but will not be meeting the project's scheduled completion date.

Case Studies for Agile EVM ...cont. 5

Sprint 0 (Recalculations)	
Product Backlog = ~~300~~ **360** points, Baseline Velocity per Iteration = **30** Budget at Completion (300 x $1500) = ~~**$450,000**~~ **$540,000** Planned Value per Iterations ~~(10%~~ 12% x $450,000) **= ~~$45,000~~ $64,800**	Cost per point = **$1500** Planned % Completion per Iteration (360 / 30) = **12%** Planned # of Iteration (~~300~~ 360/ 30) = **12**

Sprint 2	Sprint 3, 4 , 5 (Actual)
Event: Scope > from 300 to 360 points	Actuals: • Actual Points Completed = 36 (higher velocity/throughput) • Actual Cost = $32,000
	Calculations: • Actual % Completion = (36/360) = **10%** • Earned Value = 10% x $540,000 **= $54,000** • Cost Performance Index (CPI) = EV/AC (54,000/32,000)= **1.68** • Scheduled Performance Index (SPI) = EV/PV (37,000/64,800) = **0.57**
	The increased throughput resulted in: ✓Increasingly positive Cost Variance (EV-AC) ✓Improved Schedule Variance (EV-PV) and finally after 5th iterations it reached 0 ✓With the above numbers, we determine that the project will be delivered on time and on budget..

Case Studies for Agile EVM ...cont. 6

Incorporating Agile and EVM

In Conclusions:

- ✓ The above example represents a basic implementation of EVM
- ✓ This discussion demonstrates how this simple approach can deliver an effective performance measurement solution in an Agile development environment without impacting the team's velocity.
- ✓ Adding cost measurements to the traditional Agile burn rate can result in better acceptance of the Agile development philosophy in environment that are still shying away from agile approach.
- ✓ Earned Value measurements are excellent communication indicators which can be shared with all to gain better understanding and insight into the financial impact of their performance.
- ✓ For Project Manager, still using cost to calculate delivered or earned Value, utilizing EVM as part of his or her project management tools can ensure that better pro-active actions can be taken to stir the project in the right direction.

NOTE:

- ✓ Mature Agile projects instead of tracking cost based EVM, will calculated Planned Value by giving "value points" to all the user stories that make up the Minimum Viable Product (MVP). In each iteration, they will calculate total value delivered reaching towards MVP.
- ✓ Once the MVP value has been delivered, more work of lower value work may be reassessed and de-prioritize , and team may move on to other projects of higher value. This is how end up gaining cost efficiencies in mature Agile organization.
- ✓ Business or Customers will come back and say we don't need those additional features, what we have suffice our needs for now.

Contracting Case Studies

QUESTIONS?