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Launching Agile and DevOps in a 100 Year Old Company

Agenda:
- Company Profile and Business Context
- Agile Methodology
- DevOps Architecture and Demo
- Results and Learnings
USG PROFILE

FOUNDED: 1902
NYSE: USG (Listed in 1931)

Industry leader; #1 or #2 in all core businesses:

• 2015 sales of $3.8 billion
• Over 75 production facilities
• Diverse footprint with sales and operations in over 20 countries
• USG Boral joint venture with sales over $1 billion in Asia, Australia, and the Middle East
• Distribution – 142 building material distribution branches in 37 states
Business Context and Background

**Market Trends**
- Customers are consolidating
- Many markets are shifting faster and more frequently than ever before
- World is becoming more VUCA (Volatile, Uncertain, Complex and Ambiguous)

**Customer/Executive Expectations**
- Day-to-Day stuff runs flawlessly
- IT matches pace of business; helps accelerate ability to respond to changes
- IT is a key enabler for strategic agility and building differentiating capabilities

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**IT needs to build bi-modal capability and be successful in both modes**

**Mode 1**: Emphasizes accuracy and reliability – for foundational capabilities

**Mode 2**: Emphasizes agility and speed – for decision support, innovation and market facing capabilities
Challenges and Opportunities

- Funding constraints; company in the midst of a capital restructuring exercise
- Conservative company culture; cyclical business
- Transactional systems being revamped
- New to agile and DevOps; limited open source footprint
- Unable to dedicate resources full time to this effort

Launch Agile and DevOps

We decided to focus on Systems of Differentiation and Innovation for our agile and DevOps effort (mode 2); Systems of Record would continue to use mode 1
Our Objectives

**Methodology**
- Define agile methodology and onboard pilot projects
- Develop new roles and skills like scrum master and product owner
- Institutionalize bi-modal capabilities within the organization

**DevOps**
- Evaluate technology platforms to enable DevOps
- Develop automation capabilities for targeted platforms
- Institutionalize a scalable and sustainable DevOps model

Institutionalize bi-modal methodology and DevOps capabilities within the organization with minimal funding and part-time resources
Develop Bi-Modal Roadmap

- Assess if USG is ready for agile
- Develop future state recommendations
- Develop bi-modal roadmap

Build Foundation and Pilot

- Build the DevOps foundation
- Define methodology and related processes
- Develop agile artifacts and templates
- Execute pilot projects

Institutionalize Bi-Modal and DevOps

- Make agile and DevOps mainstream
- Expand coverage across organization
- Institutionalize process changes

Expand DevOps and Kaizen

- Refine methodology based on learnings
- Keep enhancing the DevOps platform
- Expand DevOps coverage
Overall Approach

Agile Literature and Industry Research

Standard Frameworks (DAD®, SAFe®)

Conferences and User Groups

USG Practices and Learnings

USG Agile Methodology

USG DevOps Architecture
USG Agile SDLC

Concept
- Program Backlog
- Business Case and Architecture (if needed)

Inception
- Product Backlog (Initial)
- Release Plan (Initial)

NOTE: Go directly to Inception if prioritized program backlog and resources already exist

Prioritization and Funding (if needed)

Resource Allocation and Iteration Planning

Construction
- Product Backlog
- Sprint Backlog
- Release Plan
- Project Dashboard
- Working Software
- Retrospective

Shippable Product Increment

2 – 4 weeks

Transition
- User Signoff and Training
- Technical Documentation
- Retrospective Results

Deployment and Stabilization

Key Deliverables

Key Results
What is DevOps?

- **DevOps**: Scaling agile to IT operations and QA
- **Continuous Integration**: Practice of merging development work with a master branch constantly to test frequently
- **Continuous Delivery**: The continual delivery of code to an environment once the developer feels the code is ready to ship
- **DevOps Team**: Team that enables Continuous Integration & Delivery
- **DevOps Platform**: Technology platform that enables Continuous Integration & Delivery

**Note**: Another term that gets used is Continuous Deployment, which is deployment or release of code to Production as soon as it is ready.
DevOps Architecture

BitBucket

Bamboo

Commit Checkin

Developer

Git Source Code Repository

Build Stage

Unit Test Stage

System/Regression Test Stage

Deploy to Production Stage

Approver

Trigger Build

Install Artifact

Run Unit Tests

Install Artifact

Run System Tests

Install Artifact

Run Smoke Tests

Build Server

Build Artifact

Unit Test Environment

System Test Environment

Production Environment

Build

Unit Test

System/Regression Test

Deploy to Production

Developer

Git Source Code Repository

Build Stage

Unit Test Stage

System/Regression Test Stage

Deploy to Production Stage

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System Test Environment

Production Environment

DevOps Architecture
DevOps Workflow

1. Create Story - JIRA
2. Create Feature Branch - JIRA
3. Pull Feature Branch - IDE/Eclipse
4. Make Code Changes - IDE/Eclipse
5. Push Change to Feature Branch - IDE/Eclipse
6. Create Pull Request to Development Branch - BitBucket
7. Approve Pull Request to Dev Branch - BitBucket
8. Pull SFA Metadata & Push into BitBucket - Bamboo
9. Deploy Code and Metadata to Dev & Run Unit Tests - Bamboo
10. Create Release Branch - BitBucket
11. Deploy Code and Metadata to Test & Run Unit Tests - Bamboo
12. Create Pull Request to Master Branch - BitBucket
13. Approve Pull Request to Master Branch - BitBucket
14. Deploy Code & Metadata to Prod & Run Smoke Tests - Bamboo
Video file available separately
Results

Successfully completed 10 projects using agile methodology

Over 50% of current application project portfolio uses agile methodology

Test to production deploy cycle time reduced from two months to two days

Automated deploys for four technology platforms; six more in progress

Developed three training courses; trained new scrum masters, product owners and coaches

"I could have never envisioned what we came up with. The new agile process enabled us to create one of the greatest solutions we have seen in a while for national accounts"
- Sales SVP, National Accounts

"DevOps has allowed us to move our code as soon as it is ready. We are now able to deliver more business value as we no longer have to wait for weeks or months for the next release"
- IT Manager, CRM applications
### Key Learnings

#### Executive Buy-in and Support
- Continued and visible executive support
- Clear objectives, goals and rationale
- Cross-functional leadership buy-in
- High visibility and collaboration

#### Personnel
- Knowledgeable and passionate team members
- Multiple champions to drive change
- Part-time, but consistent team; limit context switching costs

#### Change Management
- Train the trainer; develop internal courses
- Prepare org (beyond IT) for change
- Hands-on coaching as new projects are on-boarded

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Transition to a continuous improvement mode with agile and DevOps centers of excellence; still need champions and clear objectives
Thank You

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