Conviva and Project Management

Jose Solorio
@conviva | **#NextGenerationofTV**

Jose Solorio
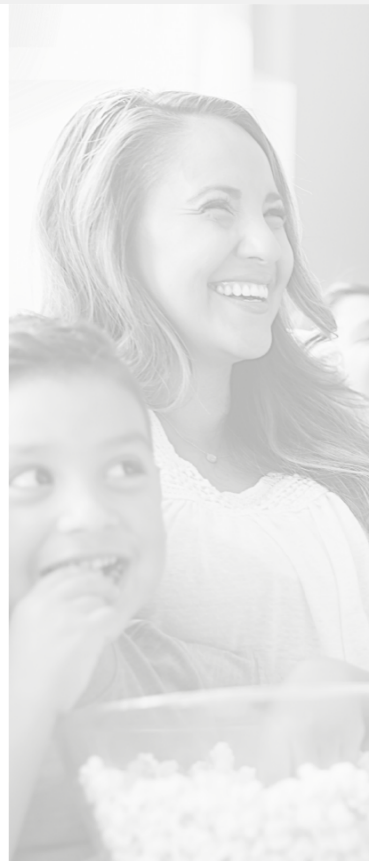
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Information Systems Management, 2008

Merrill College Affiliated

Software Project and Program Manager for

CISCO

VISA

NETSUITE

CONVIVA

HISTORY

CONVIVA

- Founded in 2006 by 2 UC Berkeley computer science professors

- Private company

- Headquartered in Foster City, CA

- Company size: ~150 employees

- Focus: Video Streaming Software and Analytics

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AGENDA

Acronyms, Foundation Information

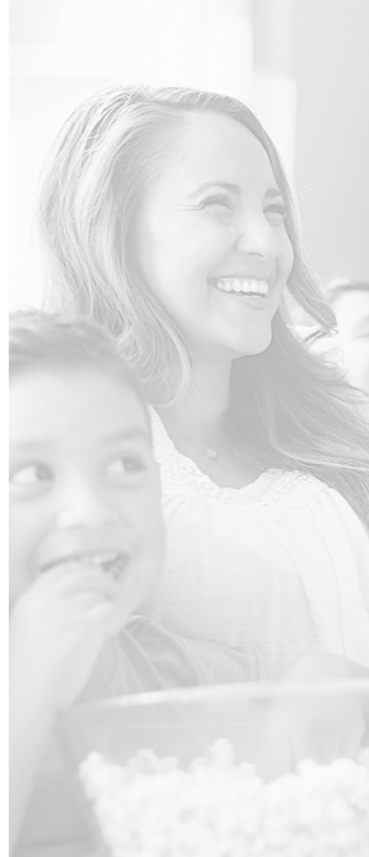Conviva

Project Management

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Acronym Definitions

Traditional Cable - TV Broadcast

Viewing delivered via cable, satellite, or other medium not internet.

Examples:

- Comcast Xfinity TV

- DirecTV

- Pay-Per-View

OTT – Over The Top

Video content delivered directly to users over the internet.

Examples:

- Hulu

- YouTube

- Netflix

AVOD – Advertising Video on Demand

Free to consumers. Paid by watching advertisements.

Examples:

- YouTube

- Crackle

- Hulu

8

SVOD – Subscriber Video on Demand

Consumers pay a subscription fee in order to watch content.

Examples:

- HBO

- Netflix

- Amazon Video
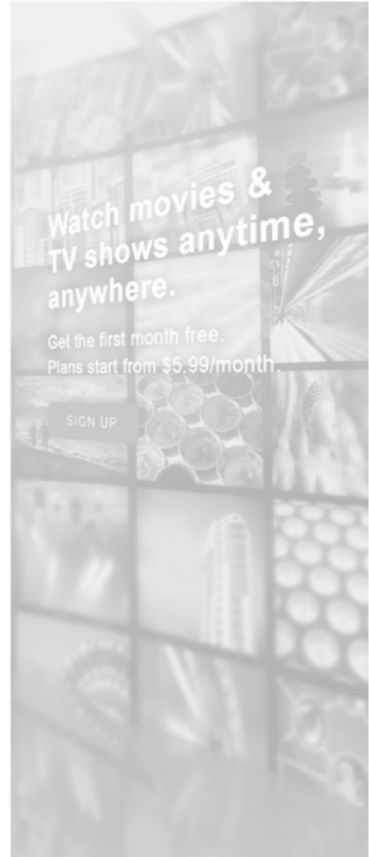
Cord Cutting

Unsubscribing from traditional cable-subscription methods.

More people ditching cable and opting for internet-based video delivery methods.

Any device, anywhere.

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Buffering

When you watch video content on a device and then the video stops playing and you see this symbol…

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Engagement vs Abandonment

Engagement:

When a user watches video content.

Abandonment:

When a user stops watching video content.

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Digital Ad Spend Is now #1

recode

2017 was the year digital ad spending finally beat TV

Source: MAGNA | Data for 2017 and beyond are forecasts • Created with Datawrapper

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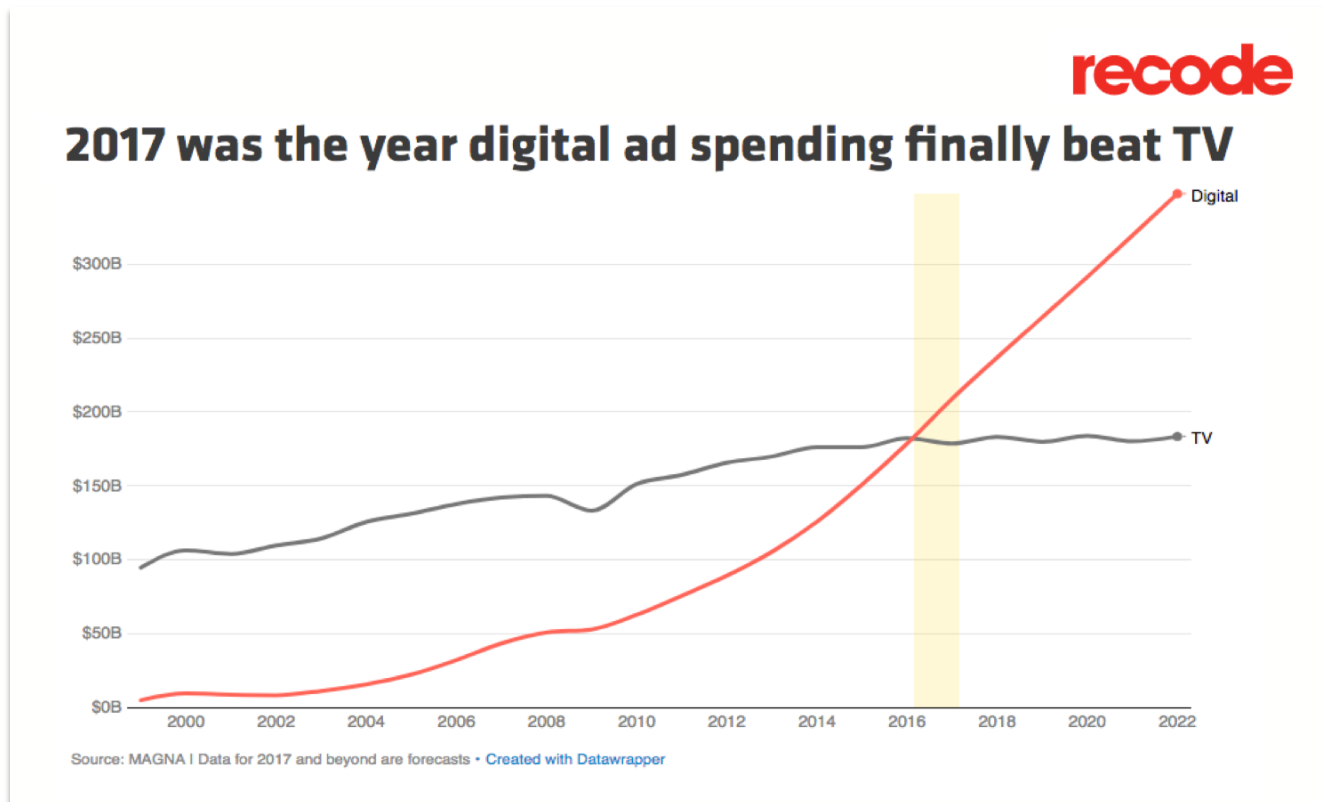
$400B TV BUSINESS TRANSITIONING TO THE INTERNET

- Video streaming is now mainstream technology

- Netflix and YouTube have proven the scale & appeal

- TV Industry is taking on the challenges & opportunities of video streaming

Global Vs. US TV Market
(Billions of Dollars)

$37
$15
$167
$76
$89
$208

THE STAKES ARE HIGH FOR THE INTERENT TELEVISION BUSINESS

● PAY TV   ● AD-DRIVEN TV   ● PUBLIC TV

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Great Content Requires Great Experience

Consumers are more in control

- Consumers want to buy and watch only the shows and channels they care about

- No bundles or waste

- Watch any show on any device at any time

The Three Epochs of TV: $400B In Transition

	BROADCAST	CABLE	OTT
DELIVERY	Fixed spectrum airwave	Coaxial cable & private networks	Open Internet wired and wireless
CHANNELS	<10 networks	10-100 networks + channels	*+1000's titles/shows*
SCREENS	1	1-5	unlimited
VIEWING WINDOW	Primetime at home	Primetime + dayparts at home	24x7 anywhere
MEASUREMENT	Discrete Audience panel	Discrete Audience panel	*Continuous census of viewers*
MONETIZATION	Audience upfront R&F	Audience upfront & scatter R&F	*Viewer hybrid digital ad + pay*
DISRUPTORS	Big 3	Cable MSO's and networks	YouTube and Netflix

Increasing complexity puts new requirements on measurement and analytics

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So where does Conviva fit in all this?

CONVIVA

In layman's terms...

Conviva makes software that reports video performance information back to video streaming providers.

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In layman's terms…

- This allows video streaming providers to understand:

  – How much content customers are watching

  – When they are watching

  – Whether there were issues during streaming and diagnose them

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Viewership

- Viewers expect perfect quality video and are quick to abandon video if quality drops

- Abandonment will impact content providers

- They want users watching as much video as possible - the more you watch, the more money they make i.e. ratings

CONVIVA

How it works

VIDEO AI PLATFORM

PRODUCTS & APIs

PROCESSOR   DATA CONTAINERS & GRAPH   AI MODELS

VIDEO SENSOR

SUBSCRIBER

NETWORK OPERATIONS CENTER
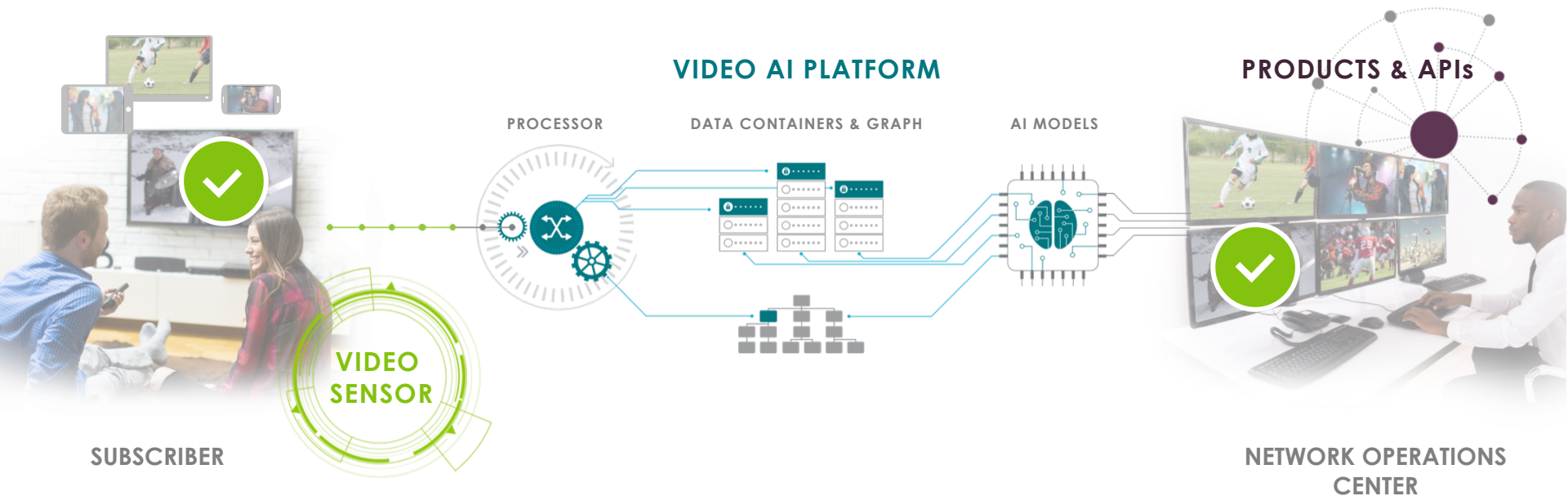
QoE and content engagement issues identified and resolved in seconds

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Complexity of Measurement

1 Subscribers are on many devices

Non-Uniform Data

2 Internet video delivery ecosystem is very complex

| 1,000s of video assets | × | 100s of origin servers | × | 10s of ISPs | × | 10s of CDNs | × | 10s of devices | × | 10s of metrics | × | 1000s of geos | = 100M+ Combinations of possible issues |
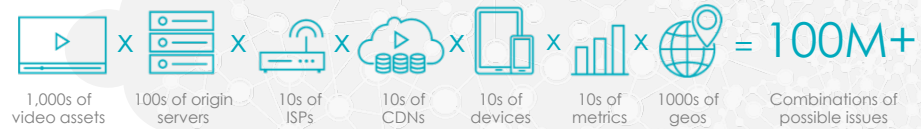
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Granular Data Indexed by Rich Metadata

15 SECONDS

DEFAULT	FULLSCREEN	MICRO	Screen Size
JOIN	PLAY	PAUSE	Player State
7000 KBPS		1200 KBPS	Rate
AKAMAI	LIMELIGHT	AKAMAI	Resource
CONTENT [sports]	AD	CONTENT [episodic drama]	Content

STATES

EVENTS

00:00   00:30   01:00   01:30   02:00   02:30   03:00   03:30

FULL SCREEN

START AD
Source: "Button"
Subject: "TeamStats"
Target: "HomeTeam"

END AD

END PLAY

START PAUSE

END JOIN

RESOURCE SWITCH
From: Akamai
To: Limelight
Bytes: 5.2MB

MICRO
SCREEN

RATE SWITCH
From: 700 Kbps
To: 1,200 Kbps

RESOURCE SWITCH
From: Akamai
To: Limelight
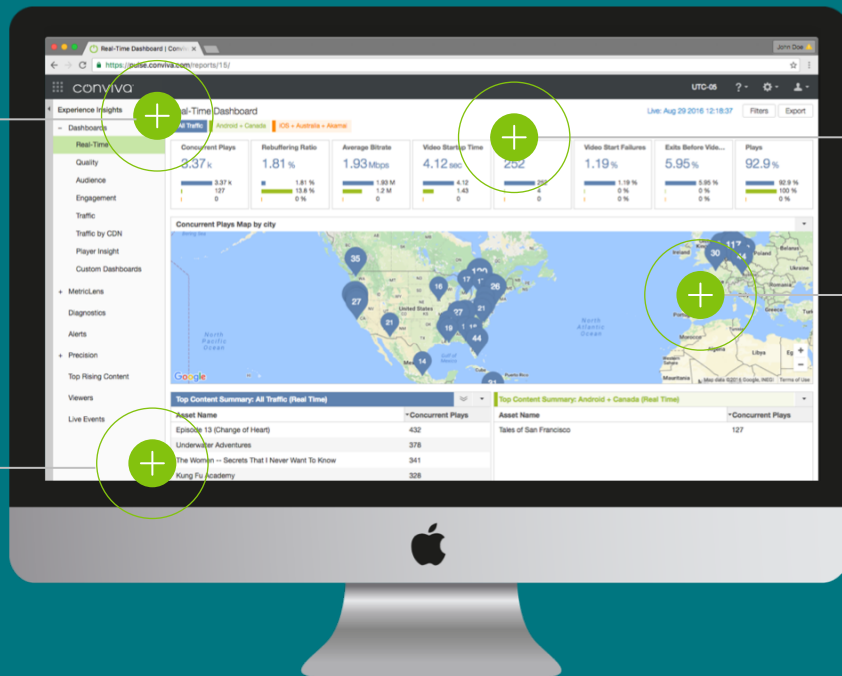Bytes: 13.1 MB

START PLAY

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And it looks like this

Ability to drill-down and see data by player type, region, by content type

Real-time traffic quality metrics
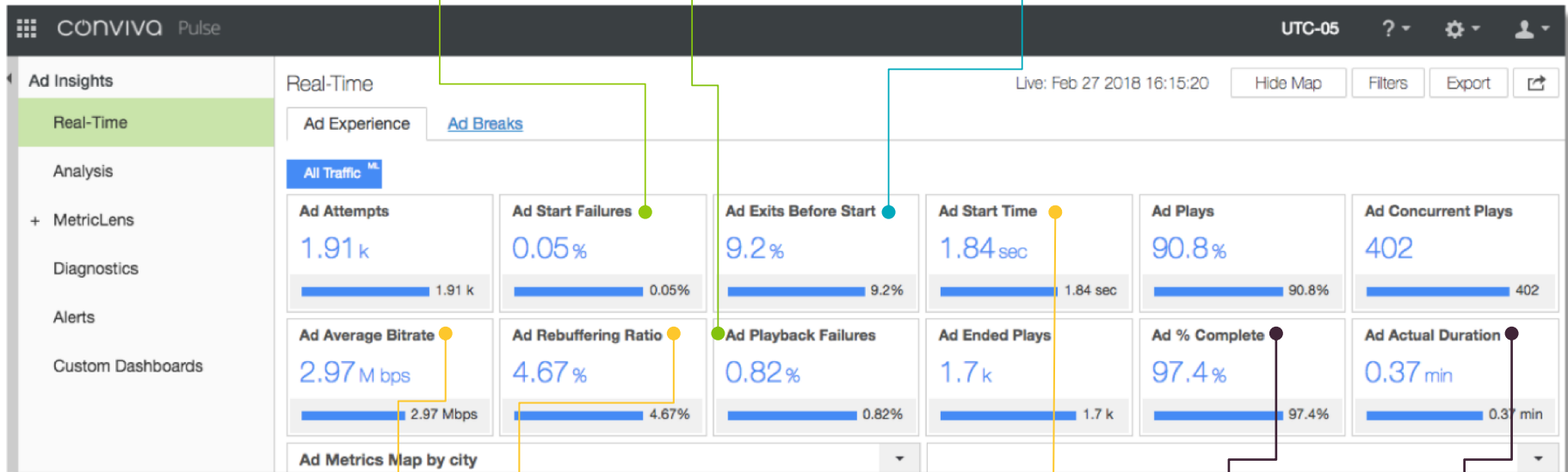
Global view of all your users

Top content being watched right now

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Advertisement Consumption Data

Identify "broken" ads in real-time

Understand ads "abandoned" by viewer

Average ad bit rate

% of ads that completed playback
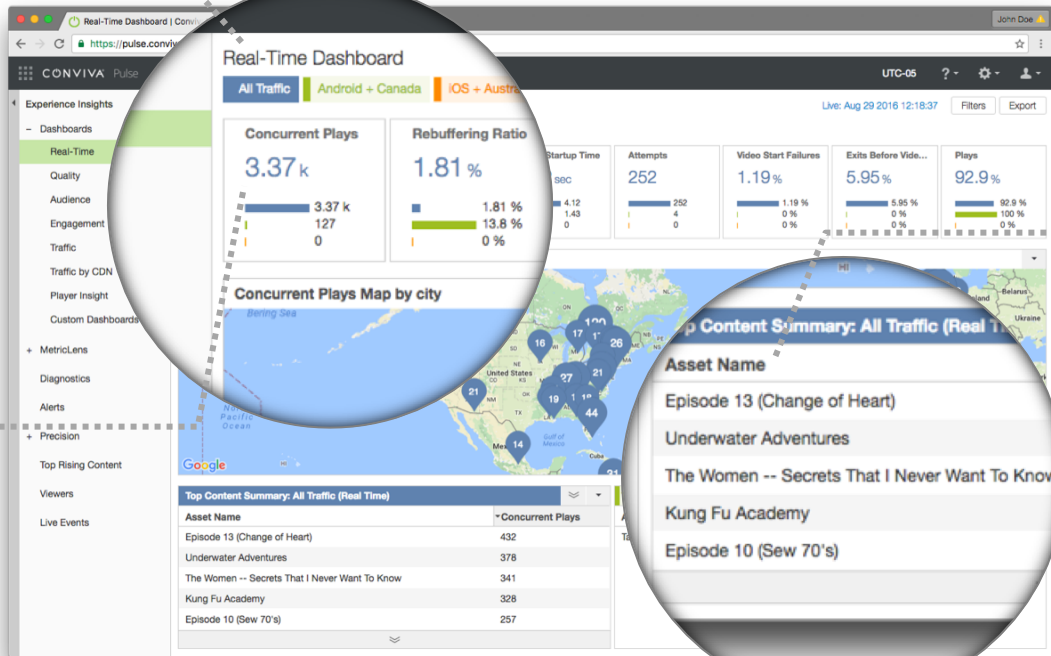
Real-Time Analysis of Quality Issues

Identify QoE issues in real time

One second granularity, 2 second updates enables fast time-to-resolution

Actionable real-time KPIs

Peak Concurrent Plays, startup, playback, and fidelity KPIs help track content delivery issues.

Top Content

Popularity of concurrent plays to enable fast editorial improvements

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Real-Time Alerting & Diagnostics

Flexible, Responsive Alerts

Flexible alert settings and sophisticated diagnosis of delivery quality issues

Detailed Analysis

Identify specific errors triggering alerts to quickly diagnose issues

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Conclusion: Video AI Architecture

Streaming Video Measurement and Analytics Powered by AI
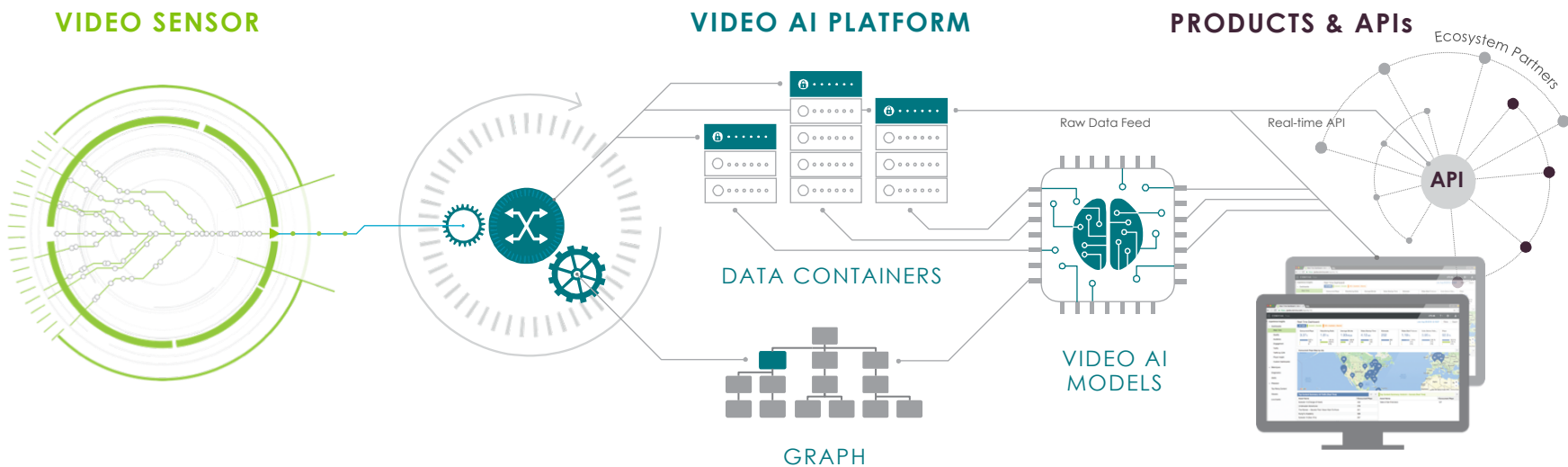
VIDEO SENSOR

VIDEO AI PLATFORM

PRODUCTS & APIs

DATA CONTAINERS

GRAPH

VIDEO AI MODELS

Raw Data Feed

Real-time API

Ecosystem Partners
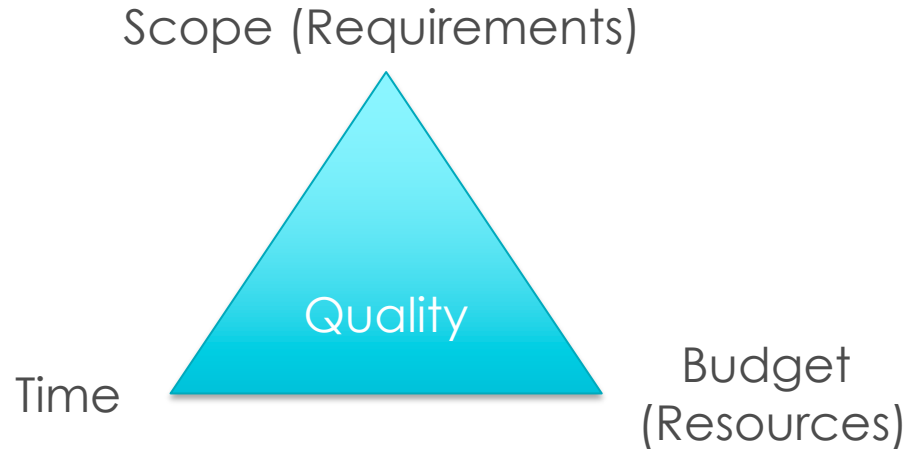
API

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📖 Acronyms, Foundation Information

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Project Management

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Project Management

- My definition: Applying tools, processes, and techniques in order to guide a software team towards producing high quality software on time and within budget

Scope (Requirements)

Quality

Time

Budget (Resources)

Project, Product, Program Management

Project Management	Product Management	Program Management
Day-to-day tracking of work being done by various individuals

Ensures members follow the processes and rules

Reports on progress and all project status information | Creation and prioritization of requirements

Work closely with customers to understand needs

Predict where the trends are going | Coordinates various teams to come together and produce a product or service

Very high level form of project management |

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Project, Product, Program Management

Project Manager

Product Manager

Program Manager

Developer

Team A

Team B

Team C

Team D
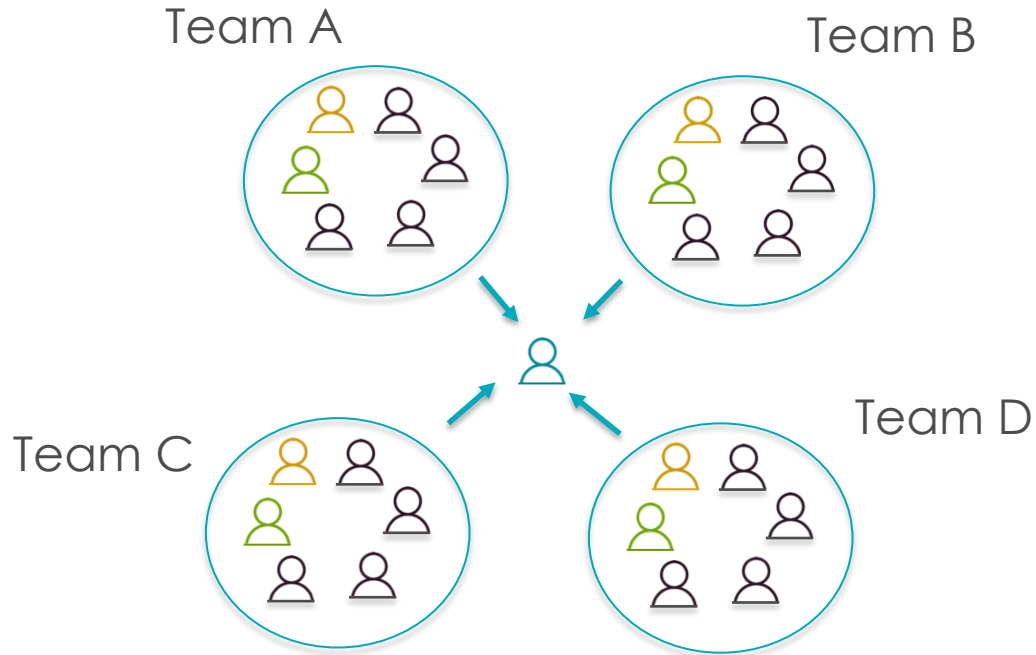
Software Development Processes

"In software engineering, a software development process is the process of dividing software development work into distinct phases to improve design, product management, and project management."

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Software Development Processes

- Various forms of software development processes exist (Also called methodologies)

- Each has their pro's and con's

- Each is best suitable for particular circumstances, project types, and timelines

- A project manager must identify the correct methodology and apply it

- Two most common methodologies: Waterfall, Scrum

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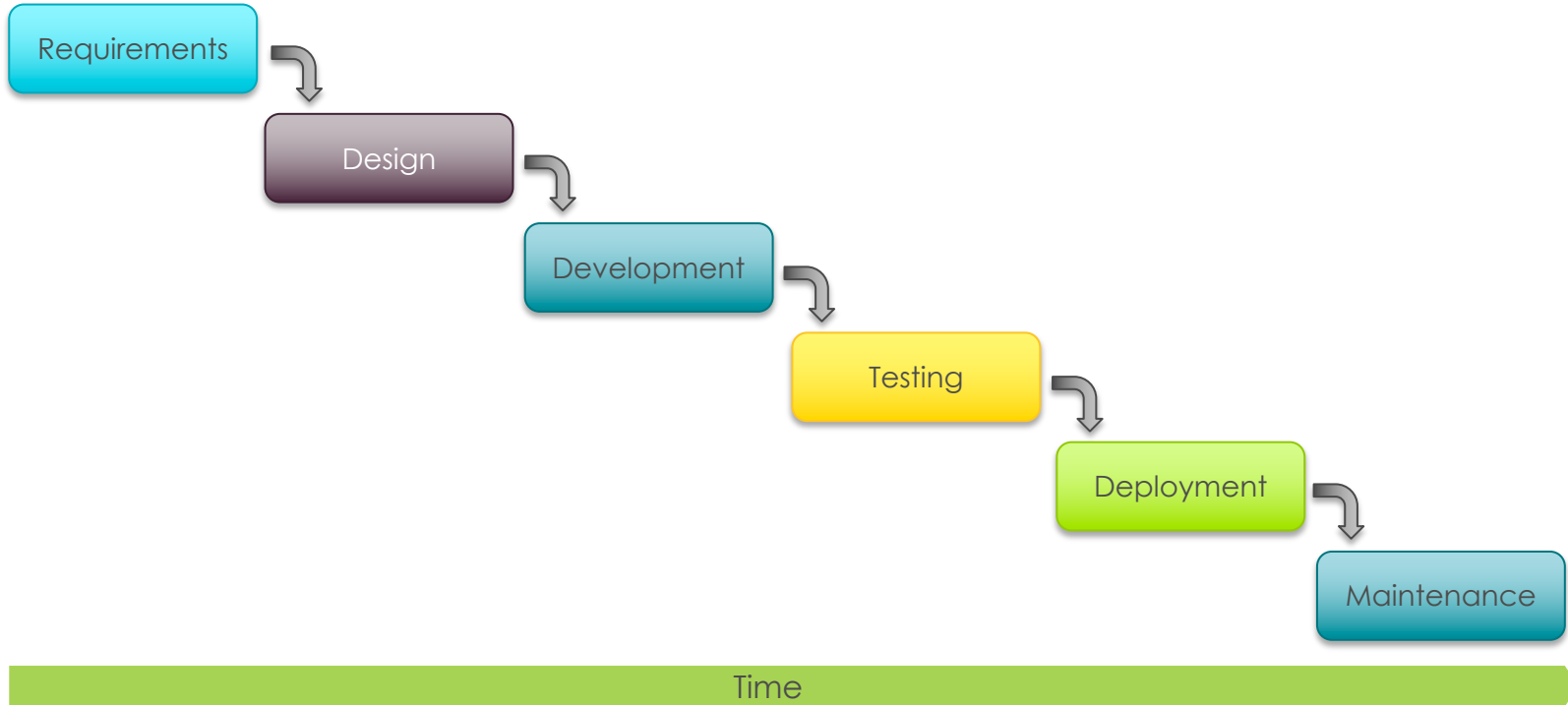
Waterfall

Waterfall – The Good

- Organizes the project life into sequential, non-repeating phases

- Usually applied to projects where requirements are known up front for the most part, won't change, and won't need customer/user feedback

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Waterfall – The Good

- The process itself is very easy for managers to understand and follow along

- Tries to identify dependencies up front and give a rough idea of the sequence of steps at the very beginning of the project

- Gives an estimate "Finish date" for the project, which managers really like to see

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Waterfall – The Bad

- Gives the illusion that all aspects of a project can be calculated and figured out up front, but rarely do projects finish on time.

- Very difficult to make design changes the further out into development phase you go

- Feedback from customers needs to wait until the later phases of the project

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Scrum Methodology

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Scrum Team

Marketing

Support

HR

Finance

Scrum Master

Product Owner

Tech Lead

Dev

Everyone <u>inside</u> this circle is
Committed
To delivering the work

QA

Dev

Dev

QA

QA

Managers

Stakeholders

Professional Services

Everyone <u>outside</u> this circle can be
Involved
In delivering the work, but are not committed to do so

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Product Owner

It all starts with a person called the Product Owner

Every Scrum team needs to have one Product Owner and one only

The Product Owner's job is to be the voice of the end-user

They own and set the direction that the product will go

This person understands the needs of the user better than anyone else and relays that information back to the Scrum team

This person usually has a background or is a domain expert in the area that pertains to the product or solution

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Product Owner

The Product Owner:
- Owns the backlog and prioritizes it
- Determines the acceptable level of quality of the product
  for shipping
- Generates a product roadmap
- Seeks technical advice from the Tech Lead of the team to make educated
  prioritization decisions
- Has the final say on what the team will work on

The Product Owner doesn't need to understand <u>how</u> the product
will be built, they just need to understand <u>what</u> will be built and by
<u>when</u>.

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QUESTION

Does the Product Owner need to be technical as well?

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Product Owner

It helps, but it is not required

Technical Product Owners can keep up with discussions and participate in meetings better

It is not required because understanding the technical aspects is the job of the **Tech Lead**. This person provides recommendations from a technical point of view so that the Product Owner can make the absolute best decisions with the technical implications factored in

Tech Leads understand how the product will be built from a technical perspective and focus purely on technical matters: Architecture, API designs, technical approaches, and they provide technical guidance

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Product Owner and Tech Lead

- The duties of a each are too broad and too much for one person to do everything.

- The duties are also highly unrelated (I.e. understanding the business side – Product Owner – versus understanding how the code is organized – The Tech Lead)

- It is better to break those up into two distinct roles and allow each person to specialize in their core job role

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Scrum Master

The Scrum Master runs the Scrum process and helps the team remove impediments

They:

- Setup and host all project related meetings

- Coach the team on the Scrum process

- Ensure the team doesn't overcommit to what can be achieved

- Work with the Product Owner to ensure the Backlog is up to date

- Produce performance metrics

- Coordinate activities with other teams

- Manage communication of project status

- Are both a leader and someone with no authority (I.e. Nobody reports to me)

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Summary

The **Product Owner** is the voice of the end-user and sets the direction of what the team is going to build (Understands the what and the why)

The **Tech Lead** is concerned with how to make those user needs a technical reality (Understands the how) and navigate the rest of the devs/qa towards that

The **Scrum Master** is there to protect the team from disruptions from outside requests, remove roadblocks/showstoppers and owns the scrum process

Dev focus purely on developing (building the product)

QA focus purely on Quality Assurance (Testing the product)
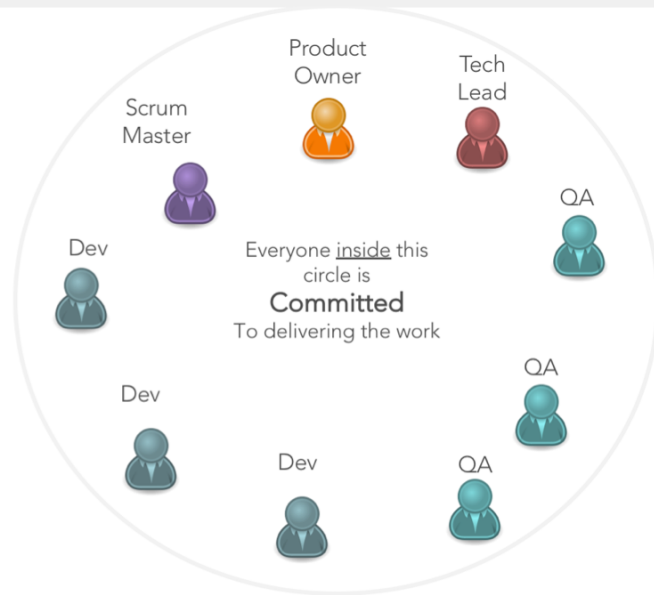
Step 1

- The Product Owner begins by asking the end user "What should you be able to do?"

What should you be able to do?

As a [**user**], I should be able to do [**X ability**] so that I can [**X benefit**]

As a [**user**], I should be able to do [**Y ability**] so that I can [**Y benefit**]

As a [**user**], I should be able to do [**Z ability**] so that I can [**Z benefit**]

Product
Owner

Customer
/ User

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Use Cases

- Those are your use cases. The Product Owner converts those to backlog items, and creates a prioritized backlog that contains them

Backlog
Backlog Item 1
Backlog Item 2
Backlog Item 3
…
…
Backlog Item N

As a [**user**], I should be able to do [**X ability**] so that I can [**X benefit**]

As a [**user**], I should be able to do [**Y ability**] so that I can [**Y benefit**]

As a [**user**], I should be able to do [**Z ability**] so that I can [**Z benefit**]

As a [**user**], I should be able to do [**N ability**] so that I can [**N benefit**]
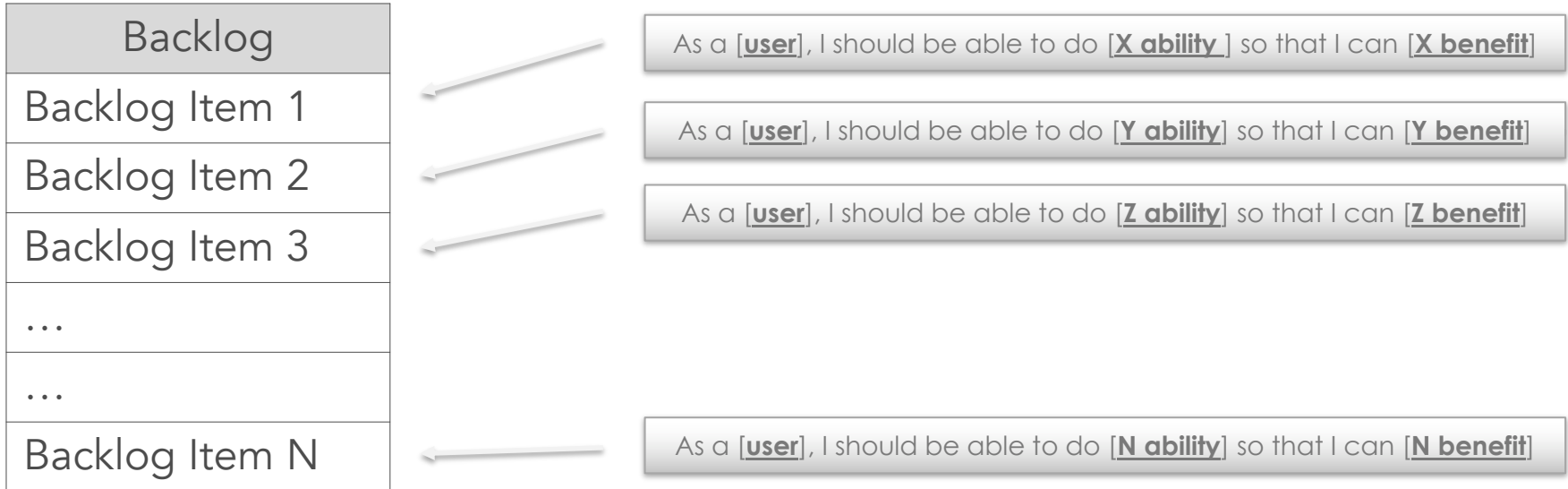
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Backlog

- A backlog is just a list of prioritized use cases that have not been committed to be worked on yet. Backlogs are owned and prioritized by the Product Owner

Backlog
Backlog Item 1
Backlog Item 2
Backlog Item 3
…
…
Backlog Item N

Highest Priority

Lowest Priority

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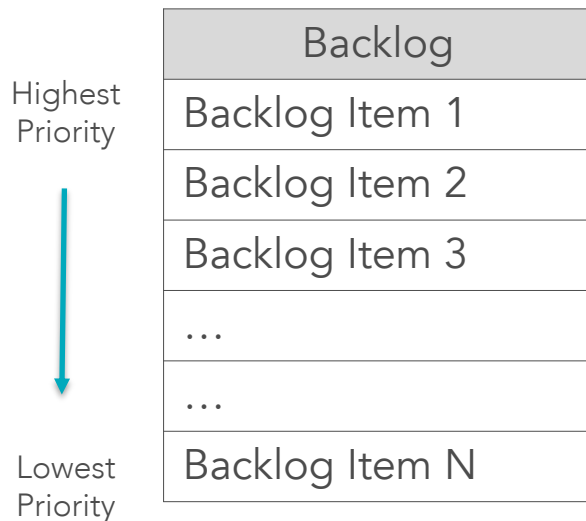
First thing: Release Planning

- Release Planning is just an initial attempt at placing the items in a Sprint in which we think we want to work on them with the caveat that the order could change later on
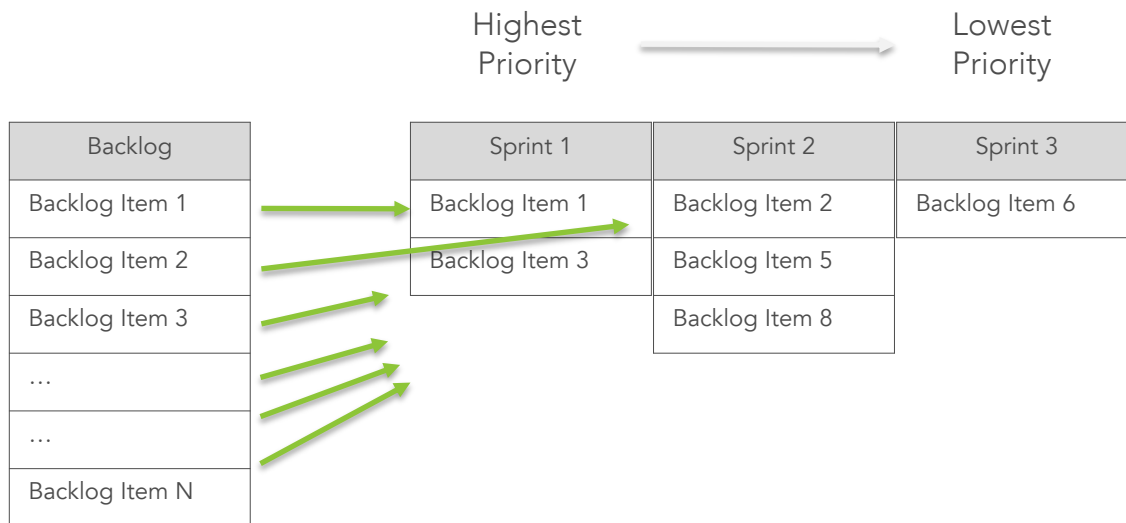
Highest Priority → Lowest Priority

Backlog
Backlog Item 1
Backlog Item 2
Backlog Item 3
…
…
Backlog Item N

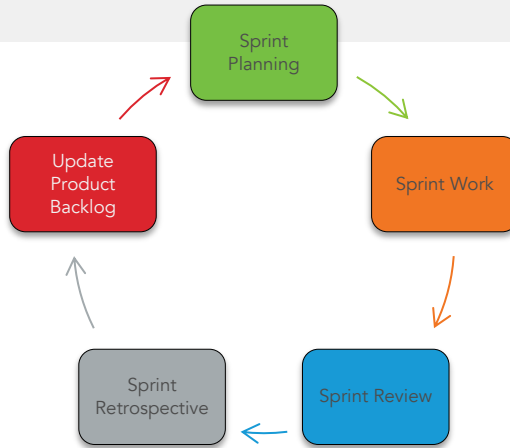| Sprint 1	Sprint 2	Sprint 3
Backlog Item 1	Backlog Item 2	Backlog Item 6
Backlog Item 3	Backlog Item 5	
	Backlog Item 8	

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QUESTION

What is a Sprint?

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Sprint

- A Sprint is just a time box with a fixed start and end date. In that time, all work committed needs to complete.

| Sprint 1 | Sprint 2 | Sprint 3 | Sprint 4 |

- A sprint produces a potentially shippable product, component, service, or result

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It looks like this

Sprint	Sprint N									
Day	Wednesday	Thursday	Friday	Monday	Tuesday	Wednesday	Thursday	Friday	Monday	Tuesday
Day #	1	2	3	4	5	6	7	8	9	10
Step	Sprint Planning	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Review / Sprint Retrospective / Update Product Backlog

Sprint

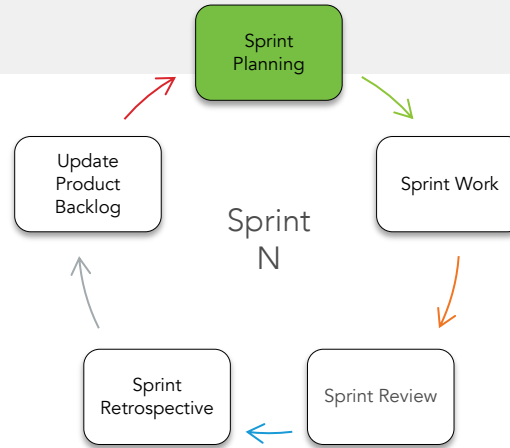- Multiple Sprints form a Release. Multiple Releases form a Theme
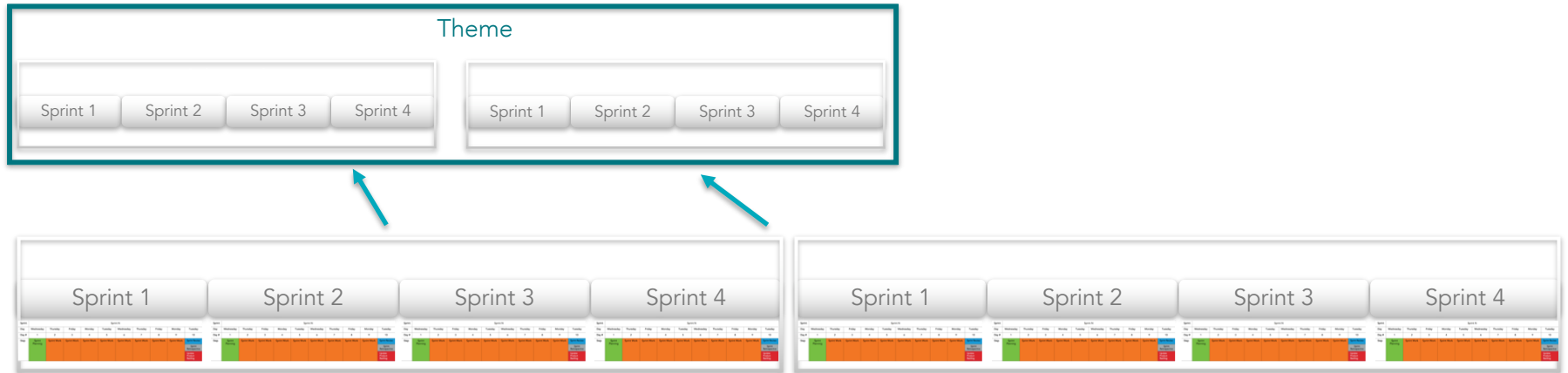
- You do not need to wait until the end of a release to push to Production. You can push to production at the end of any sprint because the code is in a **potentially** shippable state.

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Sprint Planning

- Sprint Planning happens on the first day of the sprint and in it, the team makes a commitment to deliver a set of items by the end of the sprint

- Once the Sprint Planning meeting is over, the requirements are locked in and the sprint scope doesn't change

- The benefit of this is that when you exit the Sprint Planning meeting, you will know exactly what you need to work on for the duration of the sprint and you will have been given only as much work as you can reliably deliver

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Sprint Planning happens on Day #1 of the sprint

Sprint	Sprint N									
Day	Wednesday	Thursday	Friday	Monday	Tuesday	Wednesday	Thursday	Friday	Monday	Tuesday
Day #	1	2	3	4	5	6	7	8	9	10
Step	Sprint Planning	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Review Sprint Retrospective Update Product Backlog

Sprint Planning

Update Product Backlog

Sprint Work

Sprint N

Sprint Retrospective

Sprint Review

After Sprint Planning, comes Sprint Work where you start working on those items

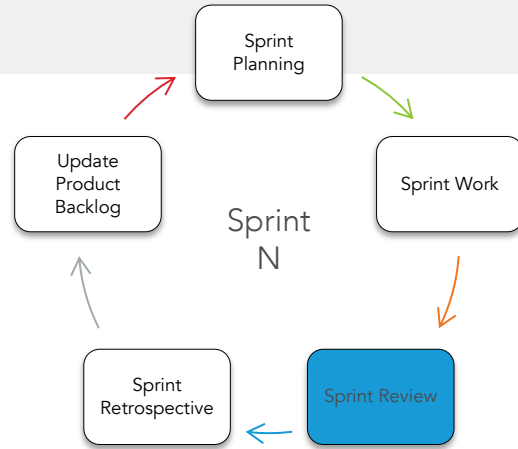| Sprint	Sprint N									
Day	Wednesday	Thursday	Friday	Monday	Tuesday	Wednesday	Thursday	Friday	Monday	Tuesday
Day #	1	2	3	4	5	6	7	8	9	10
Step	Sprint Planning	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Review / Sprint Retrospective / Update Product Backlog

QUESTION

What if the Product Owner tries to change committed items once the sprint starts?

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Scope Creep

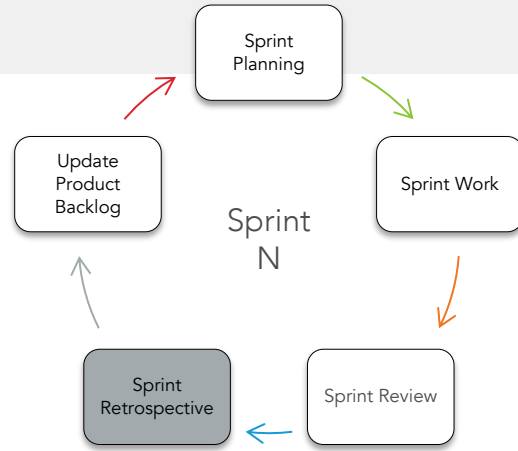- Changes / Additions / Requests once the sprint started are called scope creep

- If there is scope creep, the team should meet with the Product Owner and discuss and quickly decide whether to stop the current sprint and de-scope committed items to work on this

- Changing sprint commitments and context switching is extremely disruptive and can force devs to leave code undone, untested, uncompileable, etc.

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After Sprint Work, comes Sprint Review meeting where you demo any items that can be demo'ed to the Product Owner and get Acceptance for the items

Sprint N

Sprint	Sprint N									
Day	Wednesday	Thursday	Friday	Monday	Tuesday	Wednesday	Thursday	Friday	Monday	Tuesday
Day #	1	2	3	4	5	6	7	8	9	10
Step	Sprint Planning	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Review Sprint Retrospective Update Product Backlog

After the Sprint Review, you have a Sprint Retrospective meeting to talk about how to improve in the next sprint

Sprint Planning

Sprint Work

Update Product Backlog

Sprint N

Sprint Retrospective

Sprint Review

Sprint	Sprint N									
Day	Wednesday	Thursday	Friday	Monday	Tuesday	Wednesday	Thursday	Friday	Monday	Tuesday
Day #	1	2	3	4	5	6	7	8	9	10
Step	Sprint Planning	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Review Sprint Retrospective Update Product Backlog

After the Sprint Retrospective meeting, you update the Product Backlog accordingly in preparation for the next sprint

Sprint Planning

Sprint Work

Sprint N

Sprint Review

Sprint Retrospective

Update Product Backlog

Backlog
~~Backlog Item 1~~
Backlog Item 2
Backlog Item 3
...
...
Backlog Item N

Sprint	Sprint N									
Day	Wednesday	Thursday	Friday	Monday	Tuesday	Wednesday	Thursday	Friday	Monday	Tuesday
Day #	1	2	3	4	5	6	7	8	9	10
Step	Sprint Planning	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Review
										Sprint Retrospective
										Update Product Backlog

The following day, we start the next sprint and we start the cycle all over again

Sprint N

Sprint Planning → Sprint Work → Sprint Review → Sprint Retrospective → Update Product Backlog → Sprint Planning

Sprint	Sprint N									
Day	Wednesday	Thursday	Friday	Monday	Tuesday	Wednesday	Thursday	Friday	Monday	Tuesday
Day #	1	2	3	4	5	6	7	8	9	10
Step	Sprint Planning	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Work	Sprint Review
										Sprint Retrospective
										Update Product Backlog

Scrum – The Good

- Ideal for projects where the end product is not well known at the beginning of the project

- Brings in end user feedback earlier into the development phase

- Does away with lots of overhead documentation and processes, sign-offs, acceptance meetings, and other gating factors

- Gets a minimum viable product out for review faster that waterfall

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Scrum – The Bad

- Not ideal for projects where the end product or result is known

- Difficult for hardware type projects to implement due to the nature of manufacturing a revised physical object versus updating a line of code for software

- Not ideal for projects where dates for BETA, General Availability, and other gating dates are required in advanced

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My experience managing Software Projects

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My experience

- When I first started in 2008, Scrum not yet well adopted

- Each company adopted its own variation of Waterfall

- Took months to get a minimum viable product out using Waterfall

- Scrum took some getting used to for me and for others as well

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Challenges

- People of varying ages, work experience, personalities, skills

- Bringing all of them together to complete a common goal brings its own challenges

- At times, need to get people who don't like to participate in meetings to do so

- Need to remain calm and composed during stressful meetings and or situations

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Challenges

- Need to understand what everyone is doing at all times and need to relate at least to some degree to their language

- Need to say no to process changes (I.e. cutting corners) requested by others that could be counterproductive

- Need to know how to speak to Engineers and to Managers. Each has their own level of details they come to expect

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Duties

- Ensure no process steps are missed

- Maintain a record of important dates

- Provide regular status updates to the correct people

- Provide assistance to team members not familiar with the process and educate them on best practices

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Duties

- Ensure no team members are blocked or awaiting inputs from others. If they are, work to resolve those blocking issues right away

- Ensure the team is not disrupted by side requests from other people, managers, or stakeholders

- Ensure roles are followed and no one oversteps their role's responsibilities.

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Career Advice for Aspiring Project Managers

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Project Management

- Take TIM, computer networking, computer science, entrepreneurship, management of technology classes

- Take a summer internship job. Even if unpaid. Will allow you to get first glimpse and experience

- Join a school organization and become familiarized with technology companies, take interest, and reach out to people in the field you are interested in

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Project Management

- Having a technical background is very helpful for software project management. Allows you do quickly understand what is being talked about

- When you have a better understanding of the problem, you are better able to provide help to any team member who is blocked or awaiting input

- Various specialization areas for project managers

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Project Management Specializations

- Software

- Hardware

- IT and Infrastructure

- Security

- Customer Support

- DevOps

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Project Management Specializations

- You can also take project certifications

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Thank You

Jose Solorio
linkedin.com/in/jsolorio

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