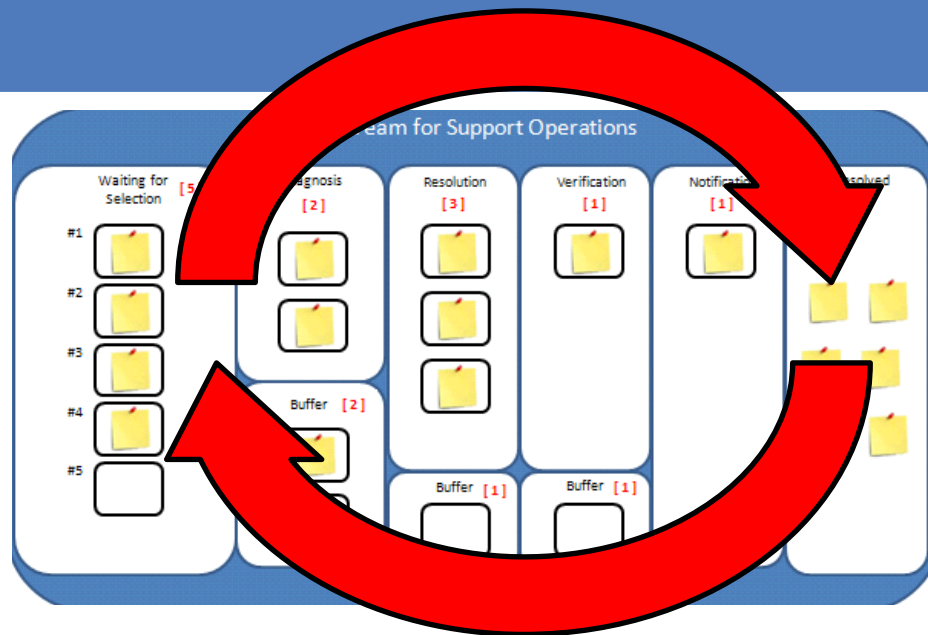


Kanban Development and the Paradigm of Flow



Alisson Vale
Technical Leader

<http://alissonvale.com/>



*Looking for Sustainability in
Software Development*

Software development is
knowledge work



In software, knowledge work can involve a large variety of activities





**direct ou
indirectly we
have to deal
with those
activities**

other factors affect us

culture

resources

people

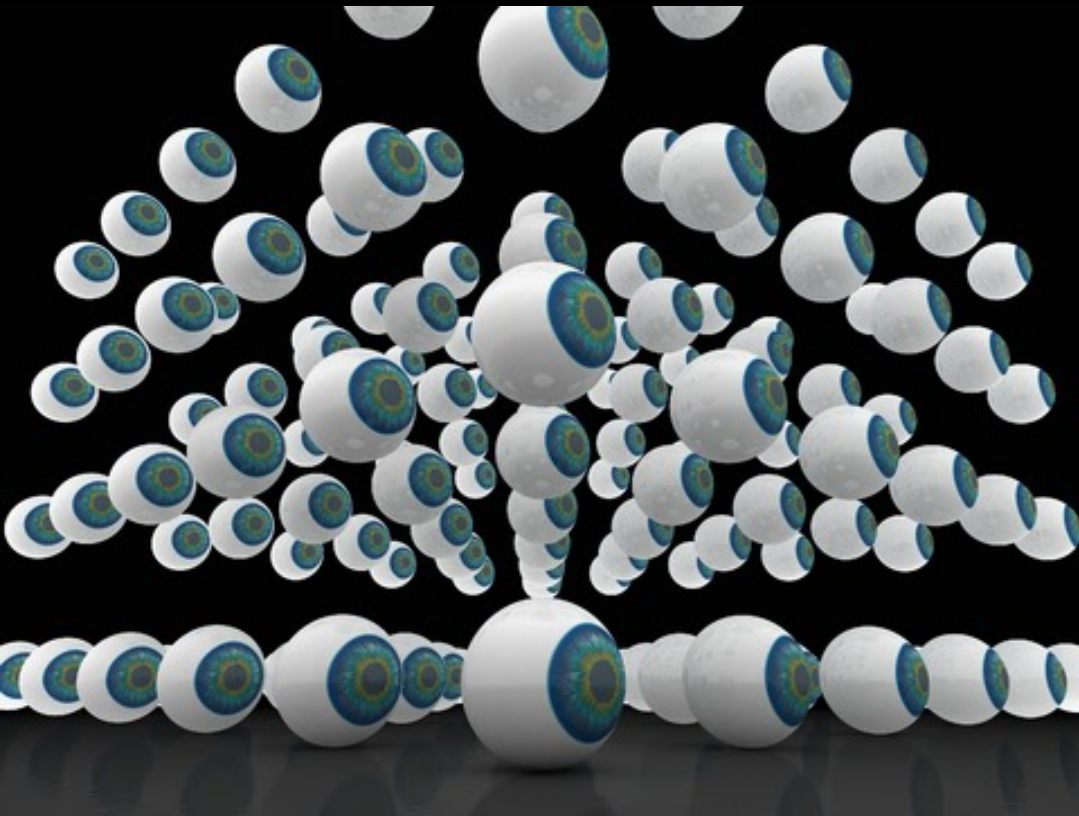
business

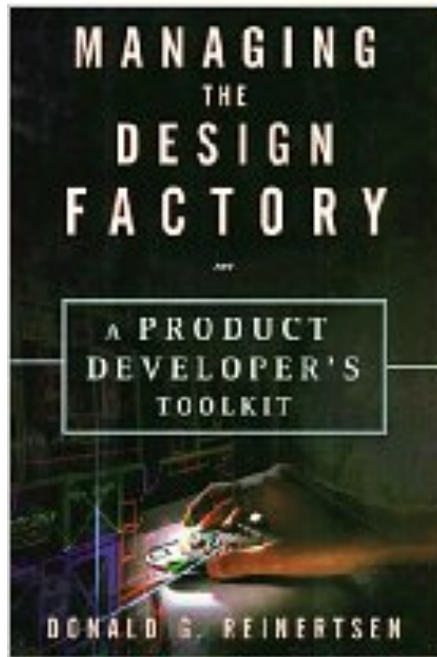
technology

risk



the amount of scenarios and
contexts is huge





"Melhores práticas são apenas as melhores em certos contextos e para alcançarem certos objetivos. Uma mudança ou no contexto ou no objetivo pode rapidamente transformar uma melhor prática em uma abordagem estúpida."

Don Reinertsen

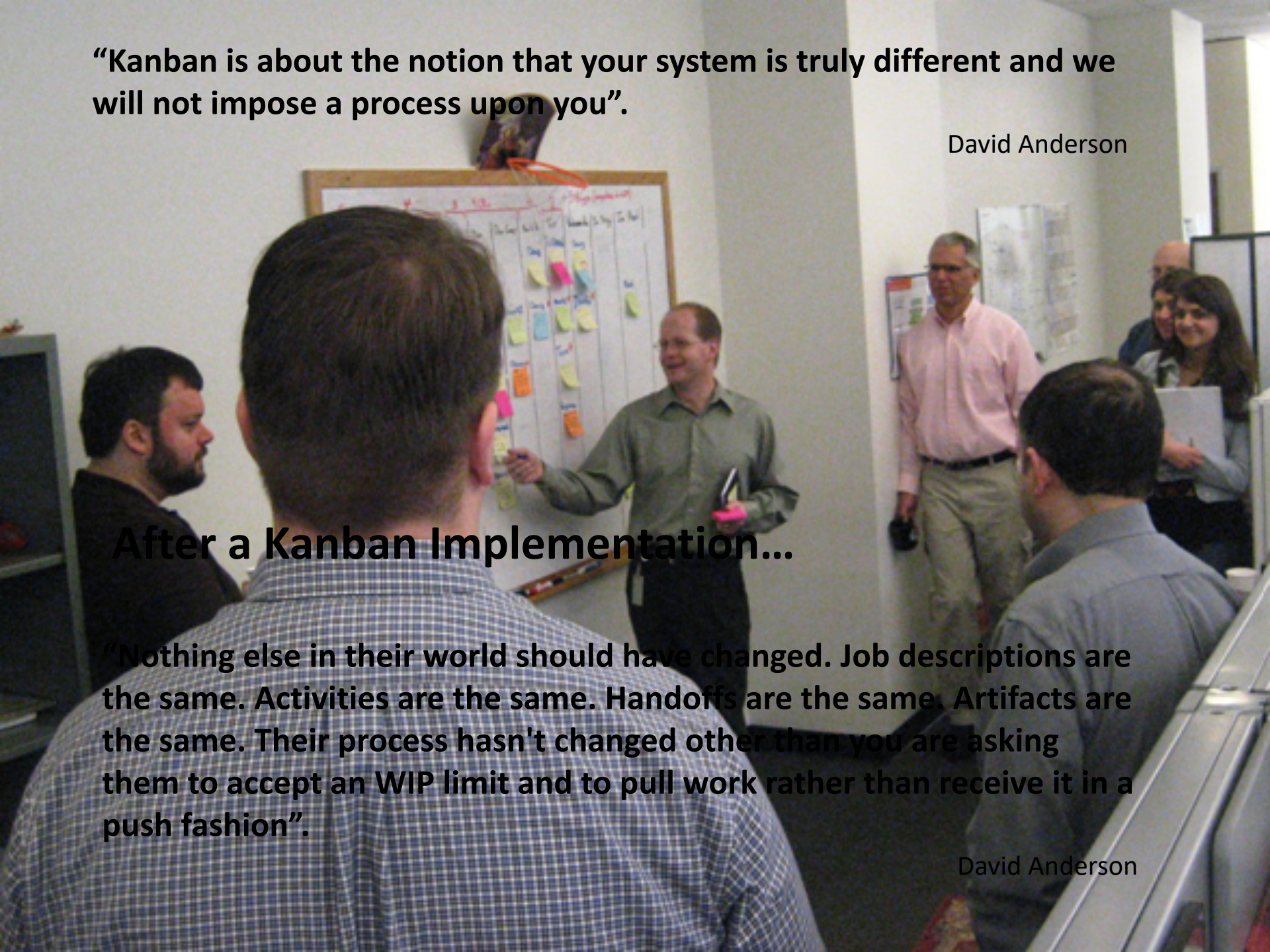
“Kanban is about the notion that your system is truly different and we will not impose a process upon you”.

David Anderson

After a Kanban Implementation...

“Nothing else in their world should have changed. Job descriptions are the same. Activities are the same. Handoffs are the same. Artifacts are the same. Their process hasn't changed other than you are asking them to accept an WIP limit and to pull work rather than receive it in a push fashion”.

David Anderson



WORK IN PROCESS

Context is relevant, so...

Kanban allows you to design processes that fits to the context, instead of manipulating the context to fit a specific process

DEVELOPMENT

BACKLOG

INSPEÇÃO

AU

the key words are...

"design"

“processes”

A collaborative exercise for Process Design



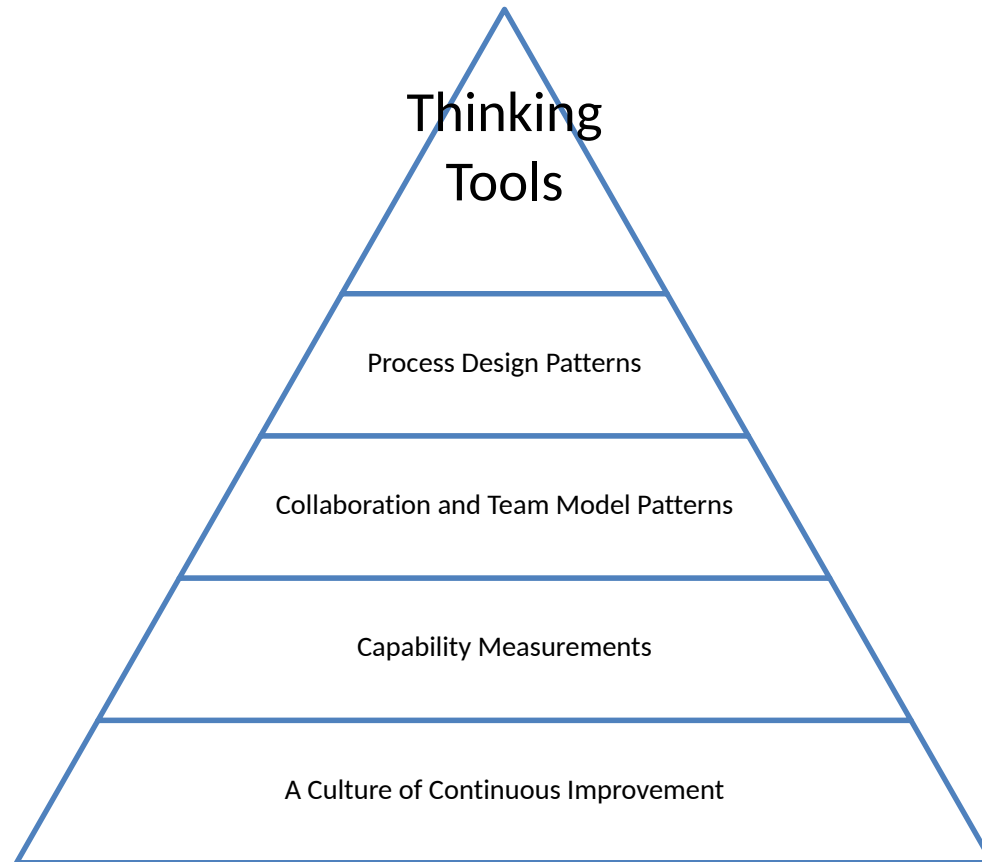
provide thinking and action tools to enable people when
they are designing their own processes

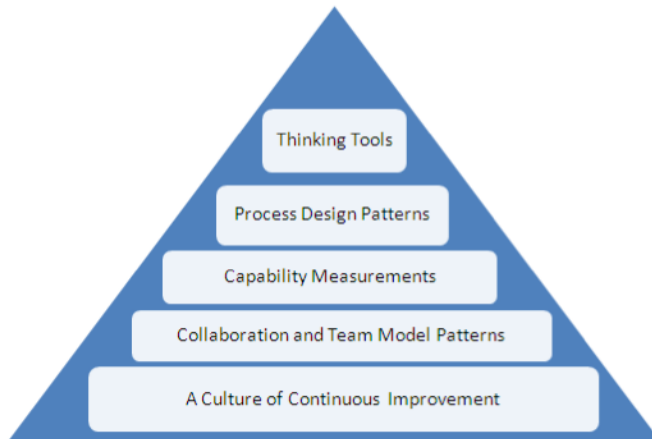
but there is more...

Kanban is also a Mindset



The Mindset of a Kanban System





Thinking Tools



Thinking Tools

#1 System Thinking



“Analytical thought doesn’t produce understanding, it produces knowledge. The product of analysis is the knowledge about **how things work**, not **why they work the way they do**. System thinking produces understanding.”

Russel Ackoff

Thinking Tools

#2 Lean Thinking



"All we are doing is looking at the time line, from the moment the customer gives us an order to the point when we collect the cash. And we are reducing the time line by reducing the non-value adding wastes."

Taiichi Ohno



Thinking about making **value** flows through the system, **improving** processes continuously and **eliminating waste** progressively.

Thinking Tools

#3 Theory of Constraints



*"A system of local
optimums is not an
optimum system at all"*

Eliyahu M. Goldratt



leveraging systems by being aware
of their bottlenecks.

Thinking Tools

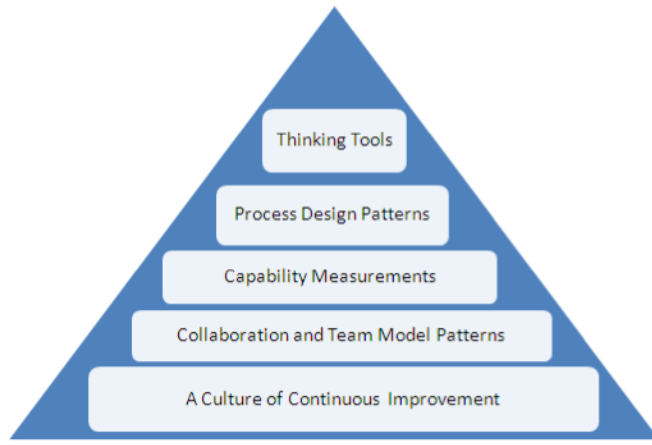
#4 Queueing Theory



"The average time in the system is equal to the average time in queue plus the average time it takes to receive service."

Little's law

managing the unpredictable nature
of arrival times and task durations.



Process Design Tools and Patterns

Essential Tools

Value Stream Map

Visual Management

Pull System & Single piece-flow

Limited WIP

Patterns for Process Design

Buffers & Queue Limits

Classes of Service

Leveling Work

Two tiered Systems (Expand/Collapse)

Swimlanes/Expediting

Triggers

Priority Filters

Perpetual Multivote for pull Scheduling

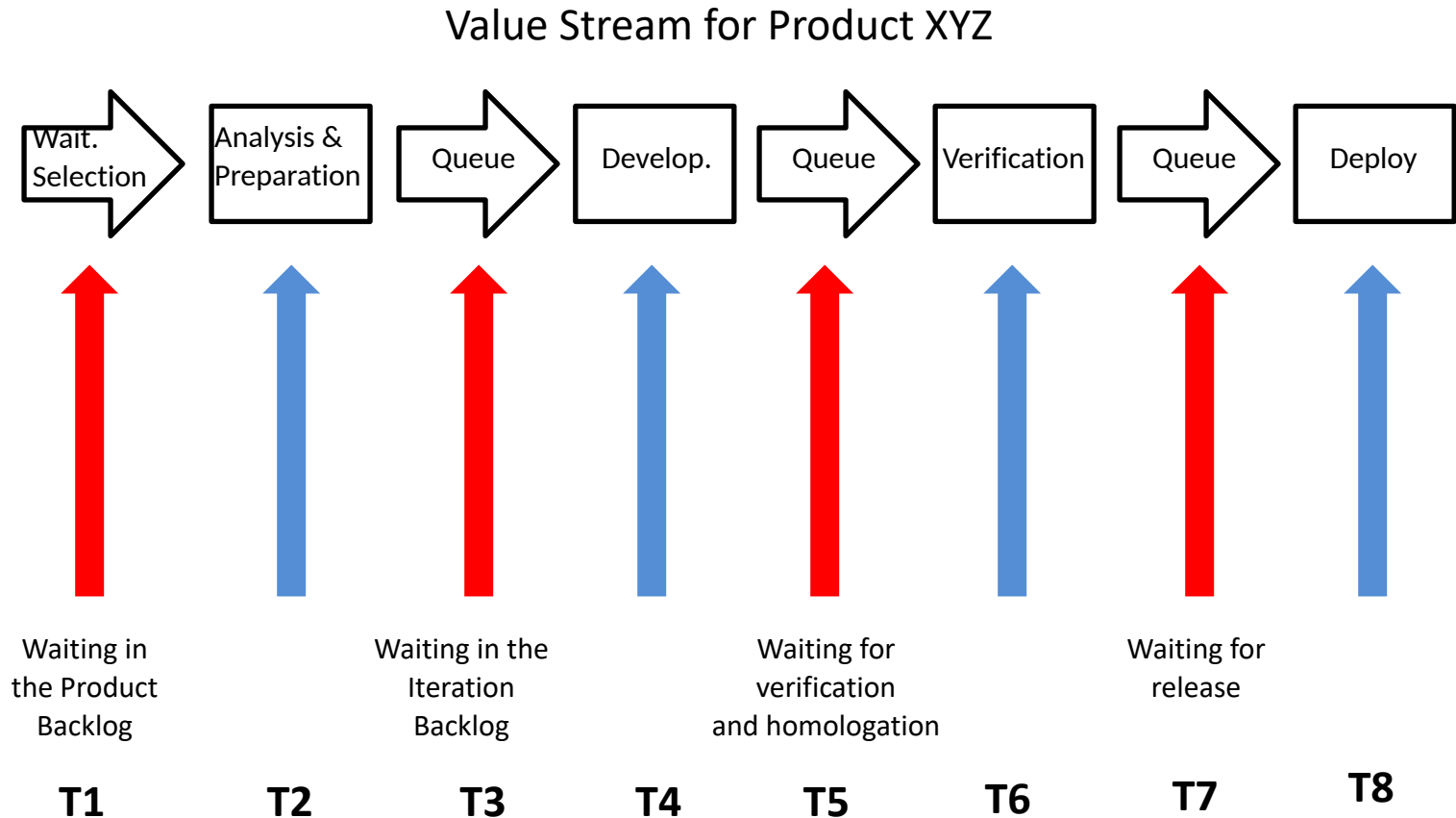
Value Stream Map

Visual Management

Pull System & Single piece-flow

Limited WIP

Essential Tools



$$\text{Efficiency (\%)} = \frac{\text{Value} * 100}{\text{Value} + \text{Waste}}$$

Essential Tools

Value Stream for Product XYZ

Waiting for
Selection



Analysis &
Preparation

Queue



Develop.



Queue

Verification



Queue

Deploy

Value Stream Map
Visual Management
Pull System & Single piece-flow
Limited WIP

Essential Tools

Value Stream for Product XYZ

Waiting for
Selection



Analysis &
Preparation

Queue

PULL



Develop.



Queue



Verification



Queue

Deploy

Why pull? Why kanban?

“People with different skills have to work together to deliver product features. Don’t build features that nobody needs right now. Don’t write more specs than you can code. Don’t write more code than you can test. Don’t test more code than you can deploy.”



Corey Ladas



Value Stream Map
Visual Management
Pull System & Single piece-flow
Limited WIP

Essential Tools

Value Stream for Product XYZ

Limited WIP = 4

Waiting for
Selection



Analysis &
Preparation

Queue



Develop.



Queue



Verification



Queue

Deploy



Value Stream Map
Visual Management
Pull System & Single piece-flow
Limited WIP

Essential Tools

Value Stream for Product XYZ

Limited WIP = 4

Waiting for
Selection



Analysis &
Preparation

Queue



Develop.



Queue



Verification



Queue

Deploy

Value Stream Map
Visual Management
Pull System & Single piece-flow
Limited WIP

Essential Tools

Value Stream for Product XYZ

Limited WIP = 4

Waiting for
Selection



Analysis &
Preparation

Queue



Develop.



Queue



Verification



Queue

Deploy

**Decision
Point**

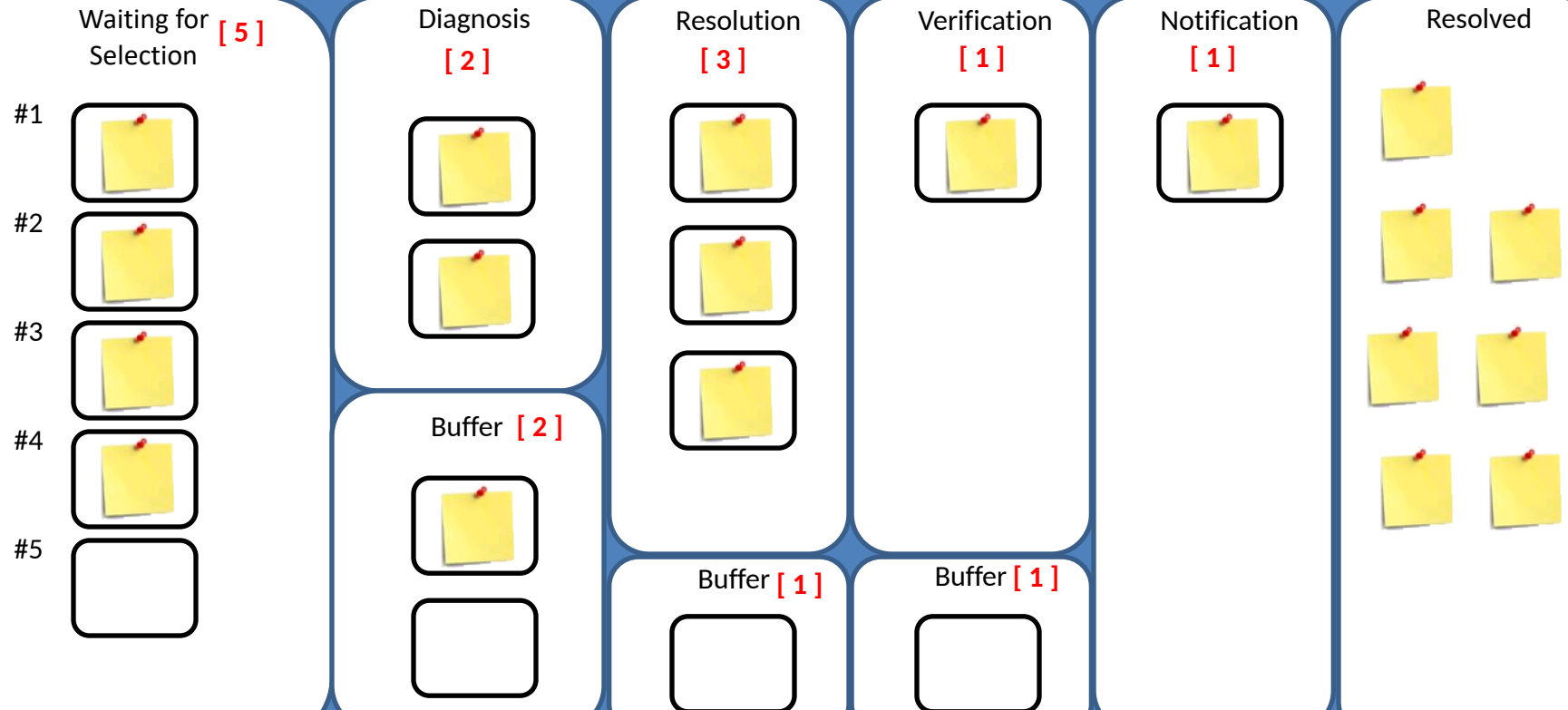


Buffers & Queue Limits

Classes of Service
Leveling Work
Two-tiers

Patterns for Process Design

Value Stream for Support Operations



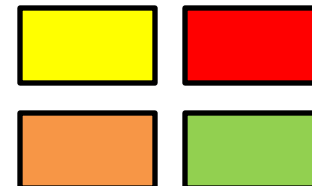
Patterns for Process Design

Classes of Service influence behaviour of the work in the system by being:

- Time-sensitive
- Risk-sensitive
- Flow-sensitive
- Policy-sensitive

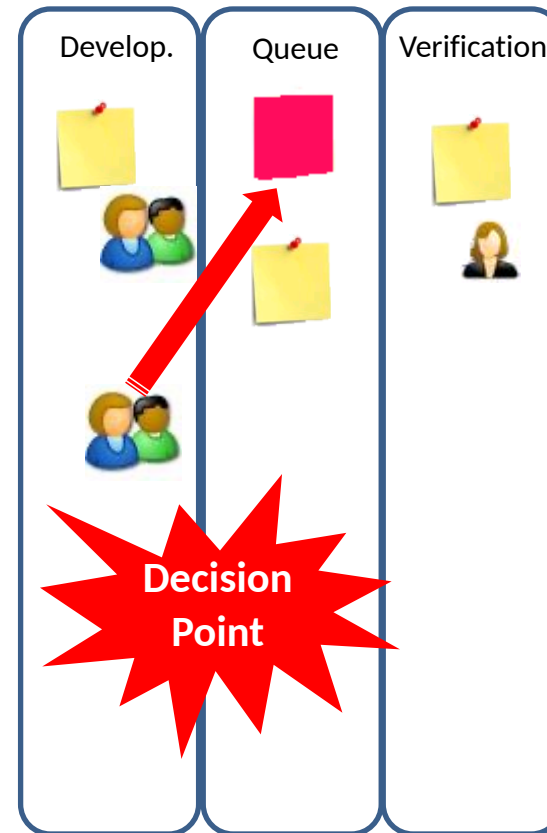
or by having whatever differentiation that matters for your process

Colors and symbols are used to differentiate work items of different classes of services.



Patterns for Process Design

Classes of Service can be one more decision element for team members



Buffers & Queue Limits

Classes of Service

Leveling Work

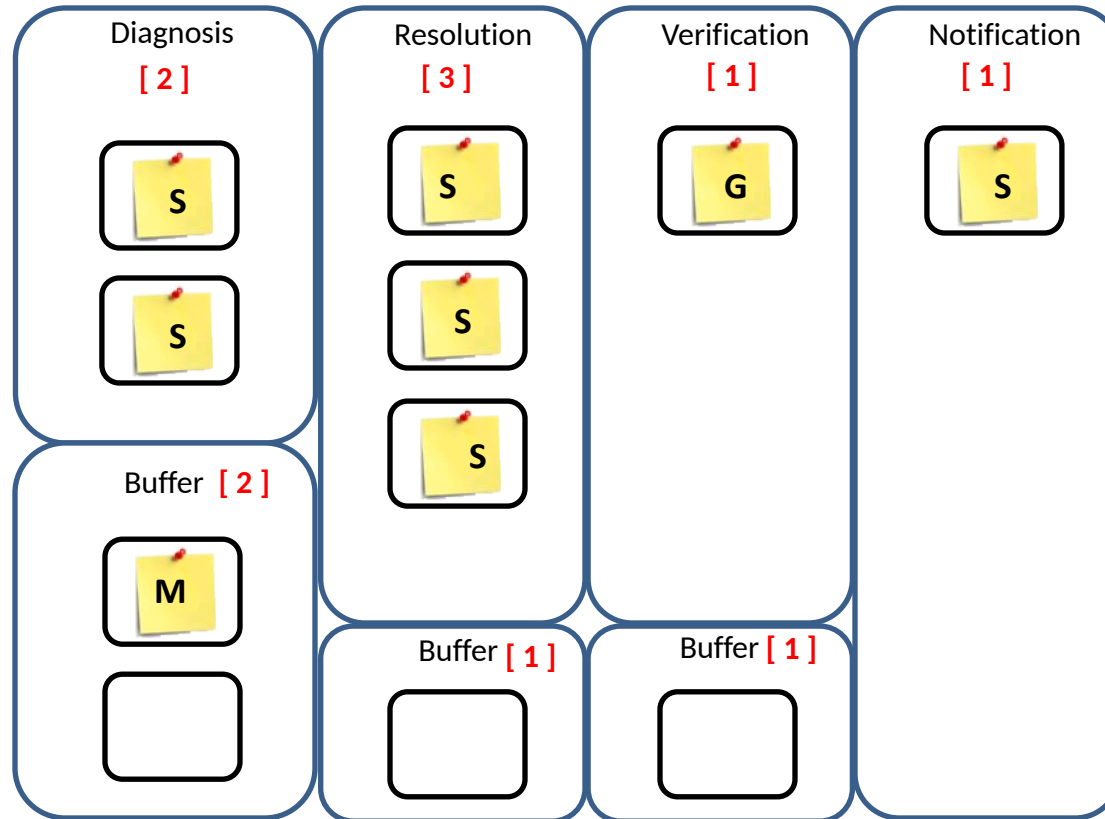
Two-tiers

Patterns for Process Design

T-Shirt Sizing

**Classification
Over
Estimation**

**Reference
Over
Commitment**



S: less than 1 day of work

M: less than 3 days

G: less than 5 days

Buffers & Queue Limits

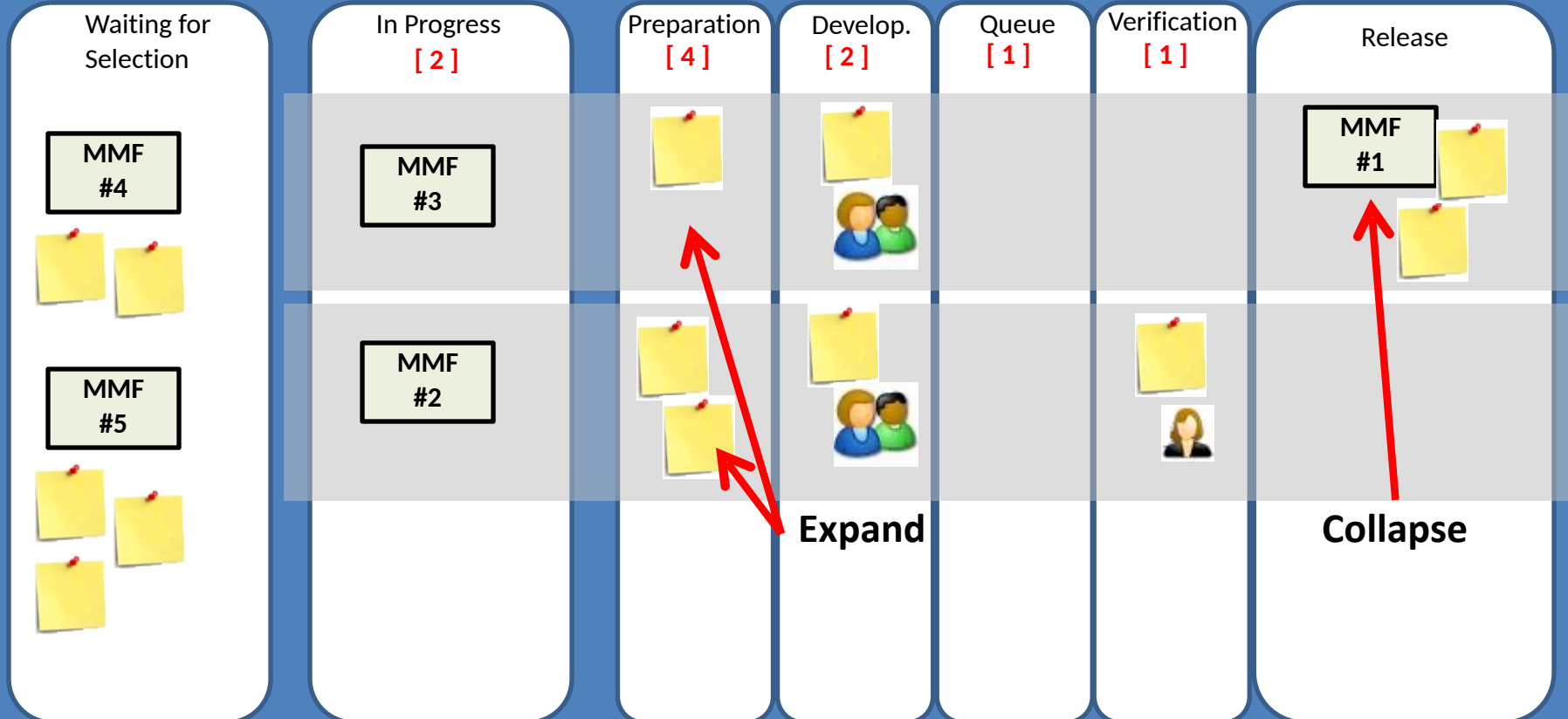
Classes of Service

Leveling Work

Two-tiers (Expand/Collapse)

Patterns for Process Design

Value Stream for Product XYZ



MMF: Minimum Marketable Feature

Swimlanes/Expediting

Triggers

Priority Filters

Perpetual Multivote for pull Scheduling

Patterns for Process Design

Value Stream for Sustaining Products with Shared Resources

Super Customer

Waiting for Selection

Preparation

[2]

Develop.

[2]

ISO-DOC

[1]

Verification

[1]

Approval

Delivery

Queue [1]

Queue [1]

Regular Customer

Waiting for Selection

Preparation

[3]

Develop.

[4]

Verification

[1]

Delivery

Swimlanes/Expediting

Triggers

Priority Filters

Perpetual Multivote for pull Scheduling

Patterns for Process Design

Value Stream with Swimlane to expediting work

Expedite

Approval
[1]

Preparation
[1]

Develop.
[1]

ISO-DOC
[1]

Verification
[1]

Delivery

Super Customer

Waiting for Selection

Preparation
[2]

Develop.
[2]

ISO-DOC
[1]

Verification
[1]

Approval

Delivery

Queue [1]

Queue [1]

Patterns for Process Design

Events can trigger a card or a collection of cards to move forward to another stage in the process

Examples:

- ☐ When a signed approval form is received
- ☐ When the build passes
- ☐ When the proposal is sent
- ☐ When a certain number of user stories are done

Swimlanes/Expediting

Triggers

Priority Filters

Perpetual Multivote for pull Scheduling

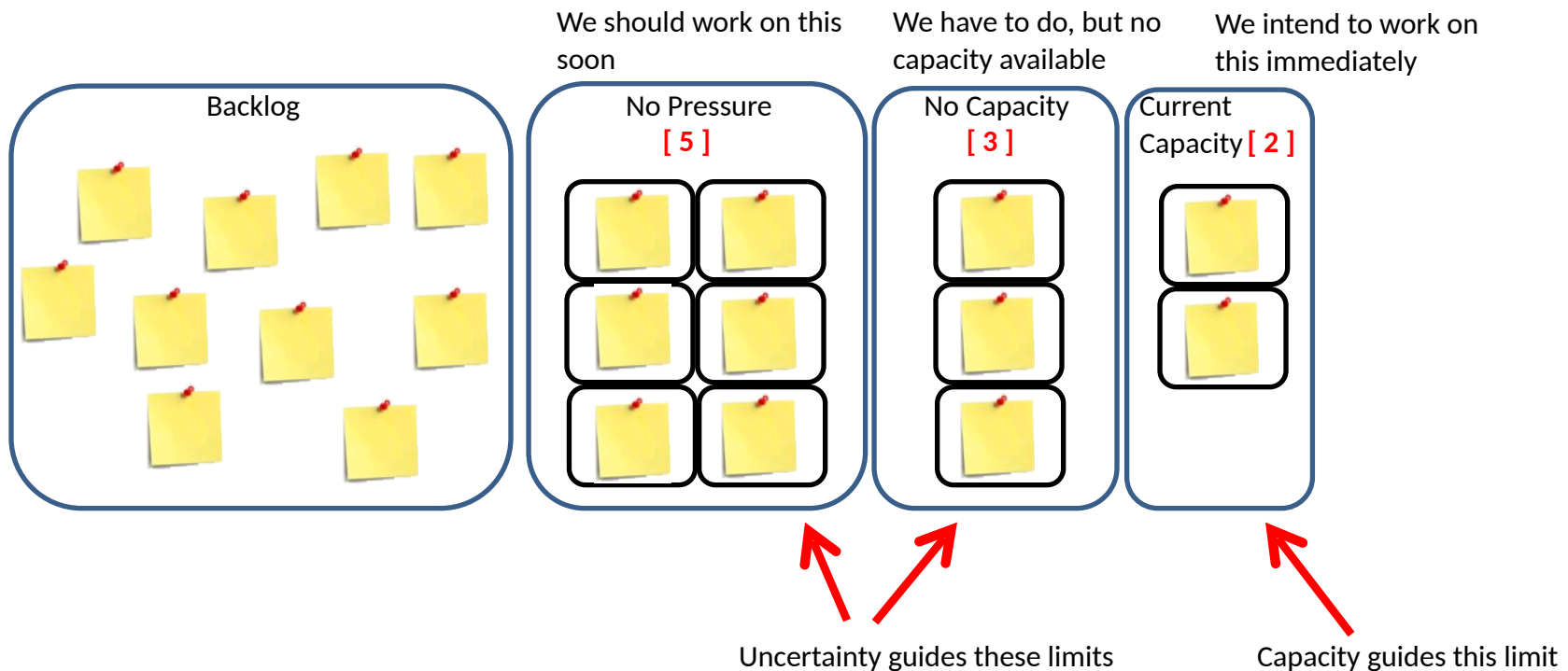
Patterns for Process Design

Designing the Selection Process



“What we really want is a method that allows us to make good sequencing decisions as late as possible and for the lowest incremental cost”.

Corey Ladas



Swimlanes/Expediting

Triggers

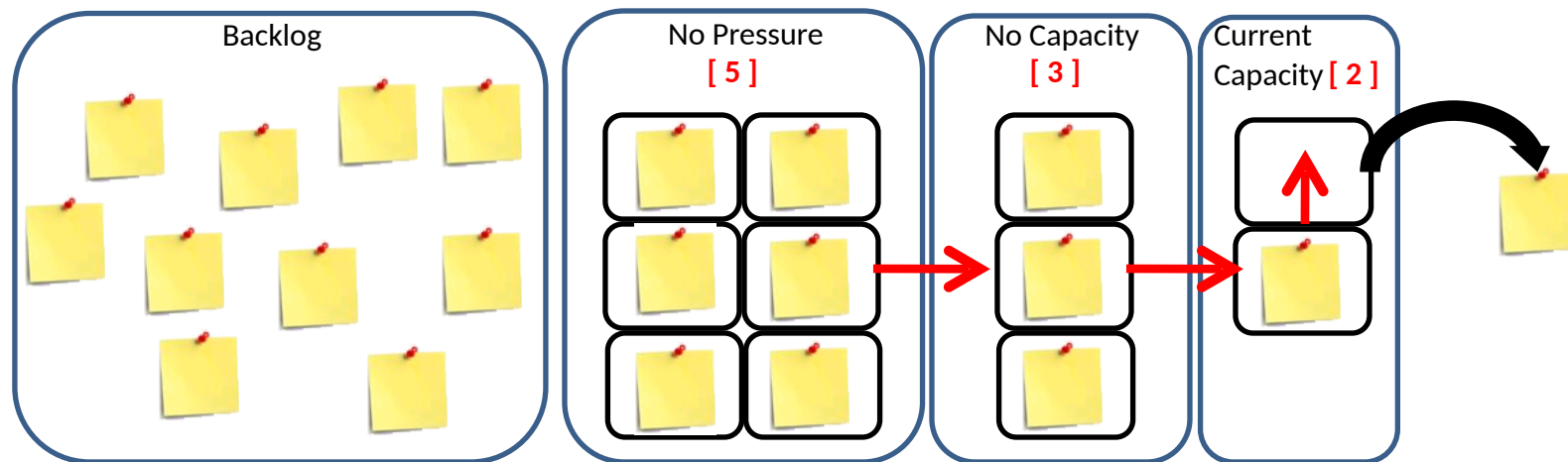
Priority Filters

Perpetual Multivote for pull Scheduling

Patterns for Process Design

Designing the Selection Process

✓ three quick decisions with one weak commitment

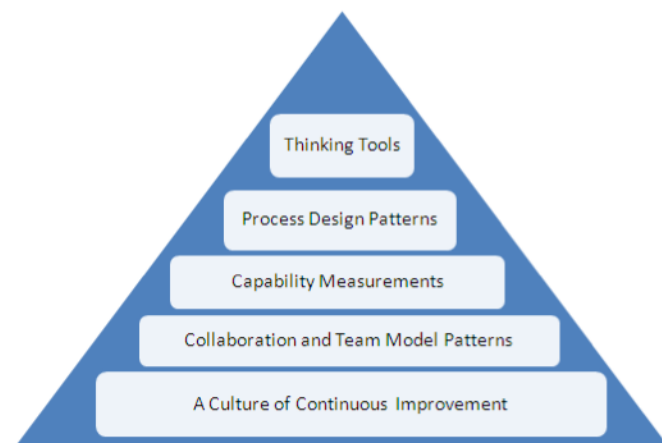


Patterns for Process Design

Designing the Selection Process

votes	feature	date
●●●●●	register user	20-9
●●●●●	log in	20-9
●●●●●	accept invitation	20-9
●●●●●	create project	20-9
●●●●●	invite project member	20-9
●●●●●	uninvite project member	20-9
●●●●●	get project	20-9
●●●●●	select project	20-9
●●●●●	add task	20-9
●●●●●	delete task	20-9
●●●●●	view task	20-9
●●●●●	order tasks	22-9
●●●●●	comment on task	22-9
●●●●●	completion	22-9
●●●●●	show task list for group/tasks	21-9
●●●●●	show active tasks	22-9
●●●●●	show blocked tasks	22-9

Also great for injection of improvement items into the system by using a democratic selection approach



Collaboration and Team Model Patterns

Self-Organization/Ownership of the Process

Swarming

Kanban daily standup meetings

Feature Teams/Teamlets

Process Ownership

Swarming

Kanban daily standup meetings

Feature Teams/Teamlets

Patterns for Collaboration

Self-Organization/Process Ownership

Stages, limits, buffers, work size, triggers, daily-basis decisions and all other process definitions are in control of the team.

Process Ownership

Swarming

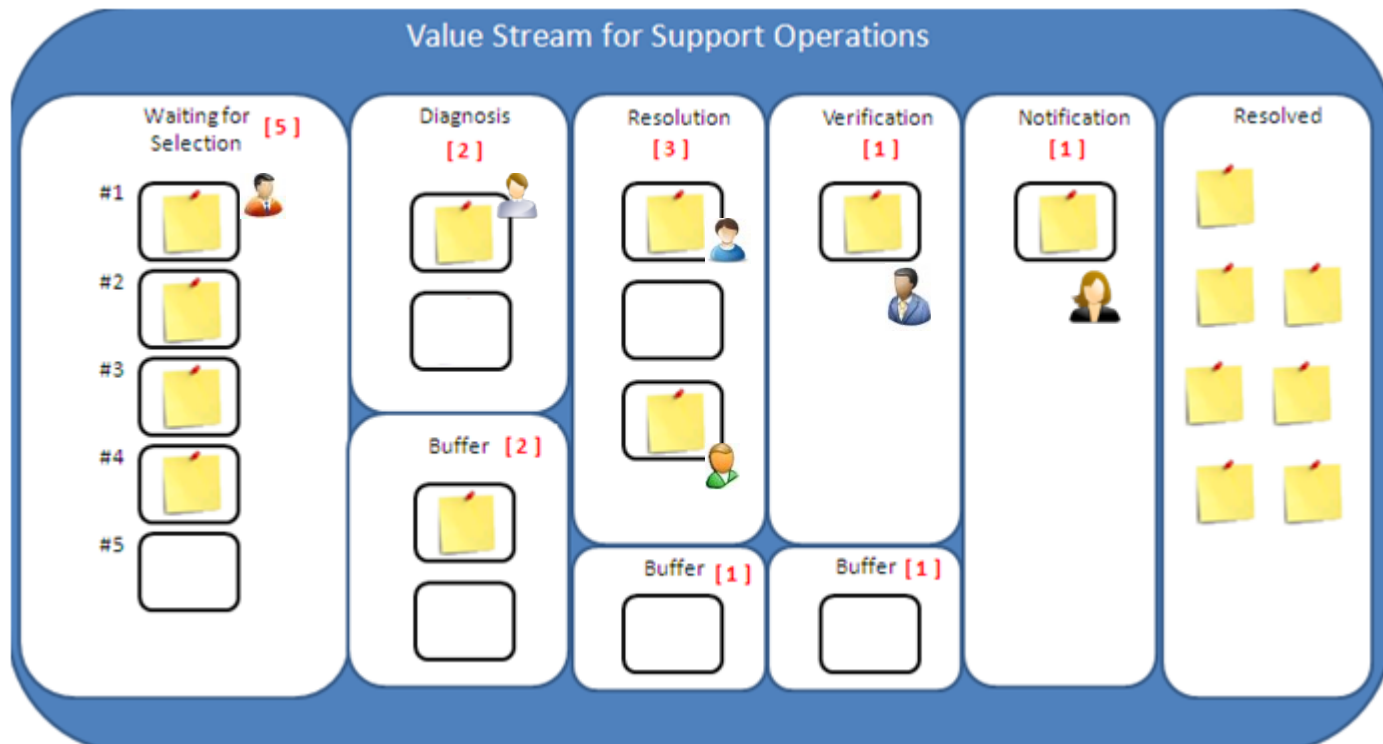
Kanban daily standup meetings

Feature Teams/Teamlets

Patterns for Collaboration

“The stages in a workflow are not people, or even roles. Just stages. So anyone can do them.”

Karl Scotland



Process Ownership

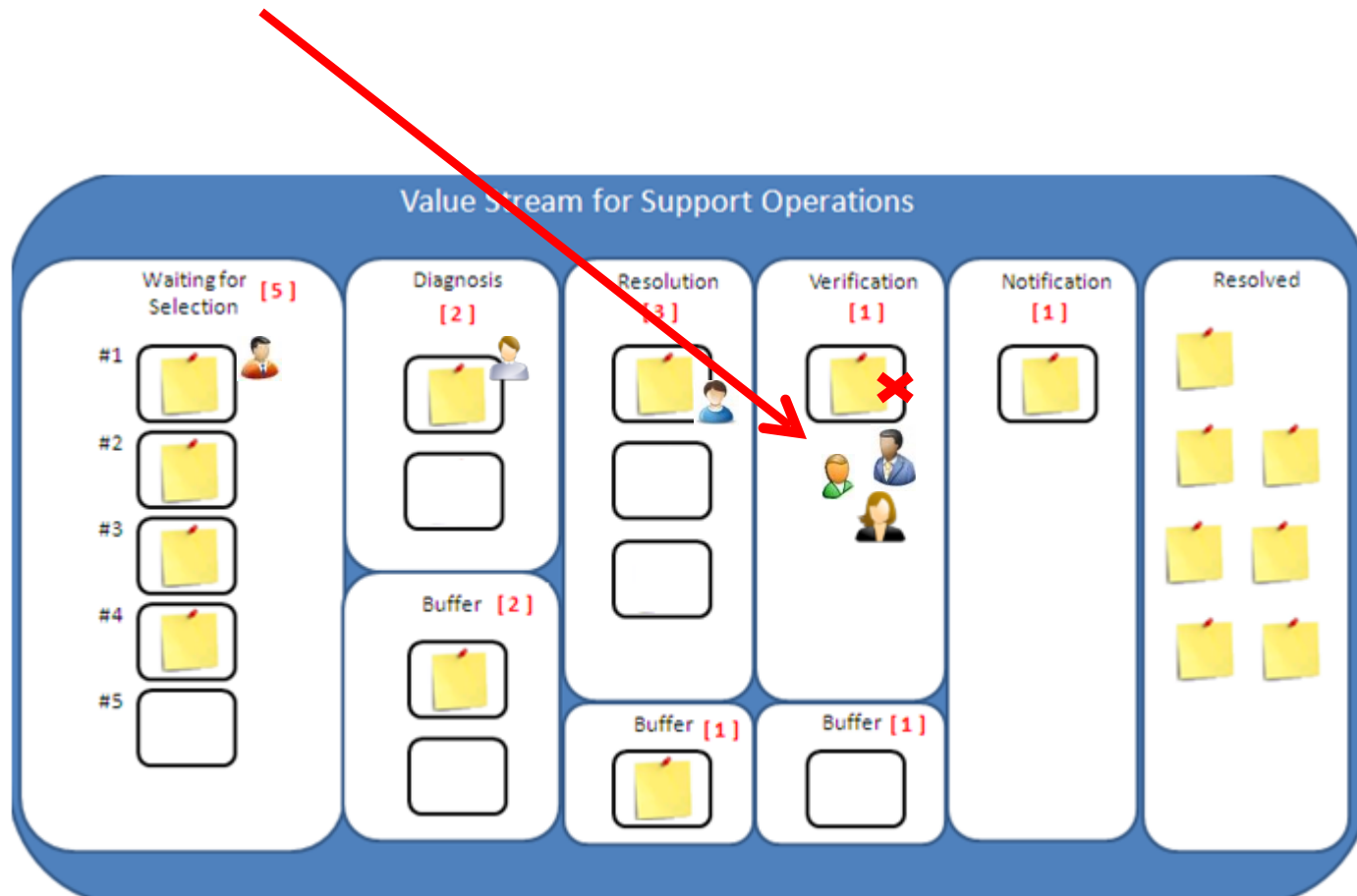
Swarming

Kanban daily standup meetings

Feature Teams/Teamlets

Patterns for Collaboration

Immediate response and cooperation to solve a flow interruption issue.



Process Ownership

Swarming

Kanban daily standup meetings

Feature Teams/Teamlets

Patterns for Collaboration

Focus on changes on the board, instead of assignments of each person.



“How big can an effective standup be?”

“This is a picture of a standup meeting on a large project at Corbis. Today I counted 41 attendees. The attendance has averaged 39 or 40 every day for 6 weeks.”

David Anderson

Process Ownership

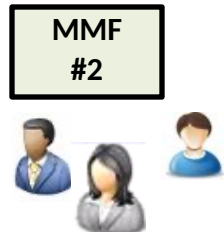
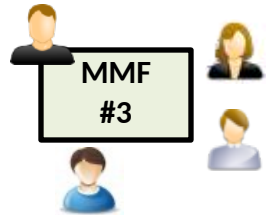
Swarming

Kanban daily standup meetings

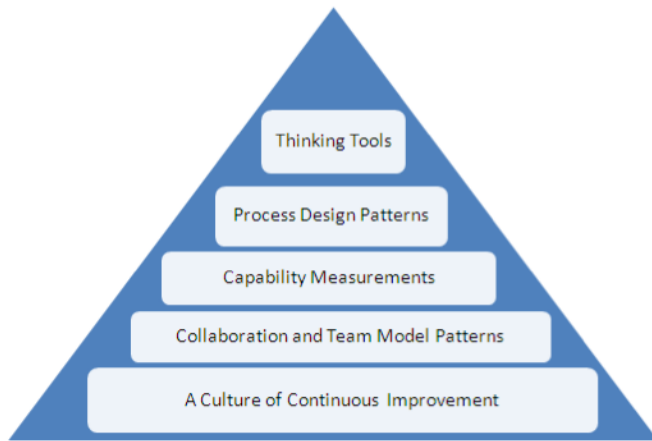
Feature Teams/Teamlets

Patterns for Collaboration

Cross-functional teams can be formed as people are getting involved with different units of work.



In, some cases, a dedicated team can be assigned to a specific unit of value from beginning to completion.



Capability Measurements

Cycle Time/Lead Time

SLA

Throughput

Cumulative Flow Diagrams

Cycle Time/Lead Time

SLA

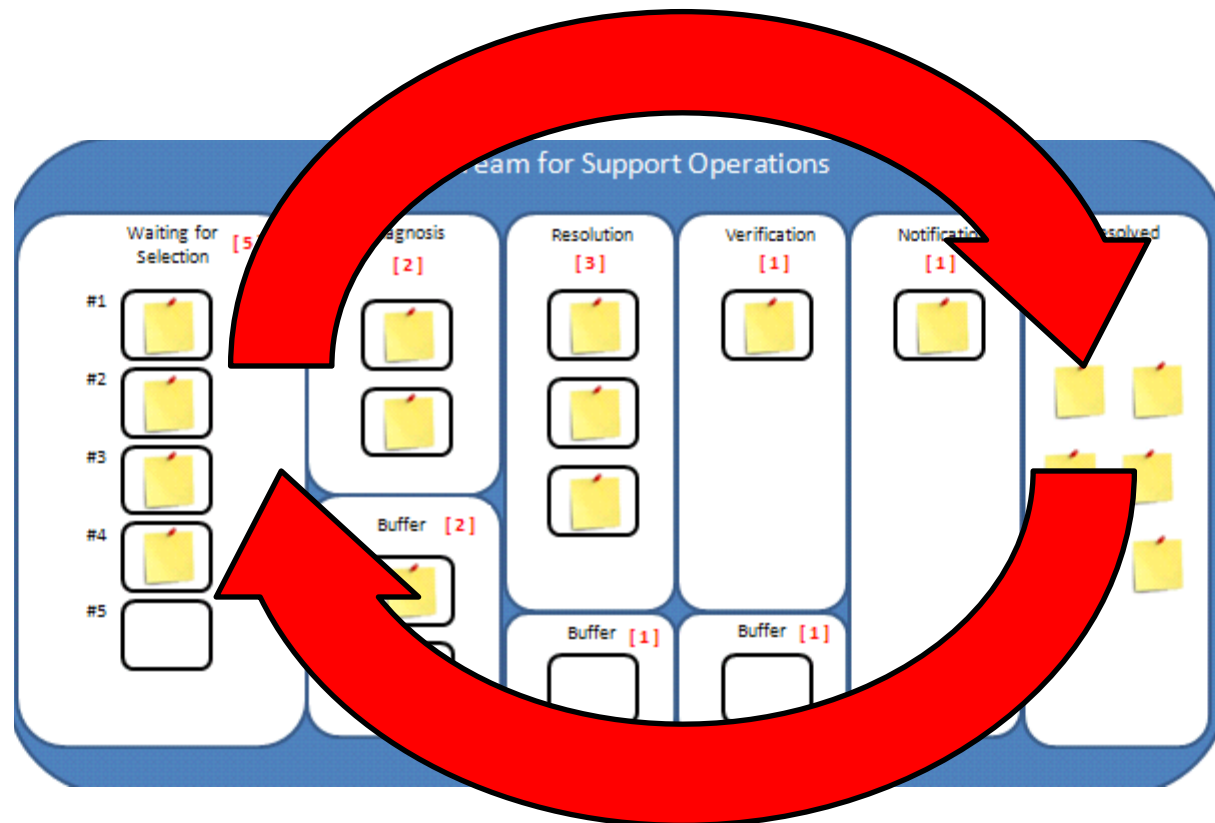
Throughput

Cumulative Flow Diagrams

Capability Measurements

Lean is about time

Cycle time



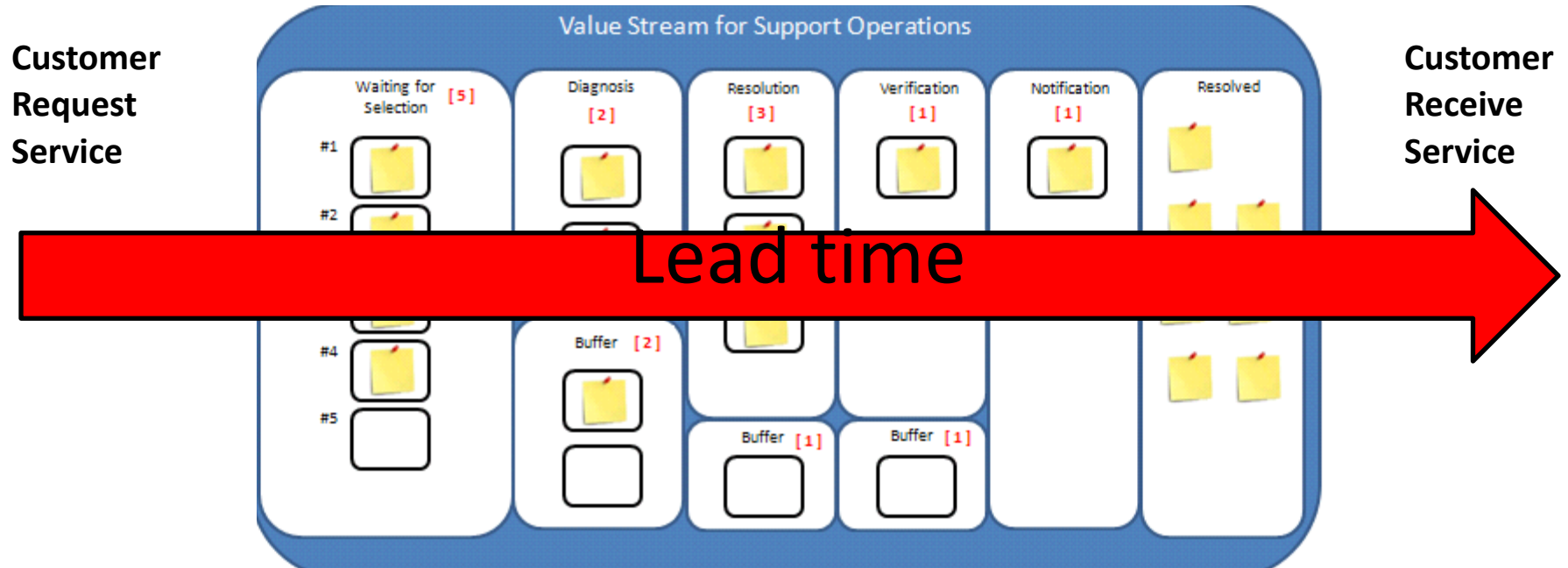
Cycle Time/Lead Time

SLA

Throughput

Cumulative Flow Diagrams

Capability Measurements



Cycle Time/Lead Time

SLA

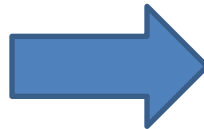
Throughput

Cumulative Flow Diagrams

Capability Measurements

Given the last 30 days of work of a certain type and size...

Work Item	Cycle Time
1456	2,34
1532	1,91
1588	1,68
1638	0,89
1644	2,12



SLA Factor	%
1,0	20%
1,5	20%
2,0	60%
2,5	100%
3,0	100%

SLA should be a reference, not a contractual commitment

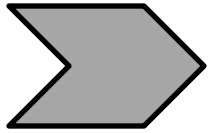
Cycle Time/Lead Time

SLA

Throughput

Cumulative Flow Diagrams

Capability Measurements



Throughput can be useful for Senior Manager analysis and for understanding System performance

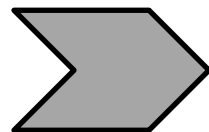
DDP – Due Date Performance



Volume that missed SLA



Volume that was delivered on Time



Throughput transparency can lead you to build a strong trusting relationship with business investors

Cycle Time/Lead Time

SLA

Throughput

Cumulative Flow Diagrams

Capability Measurements

The importancy of throughput is not
in establishing and achieving goals,
but in putting the system under
control.

Cycle Time/Lead Time

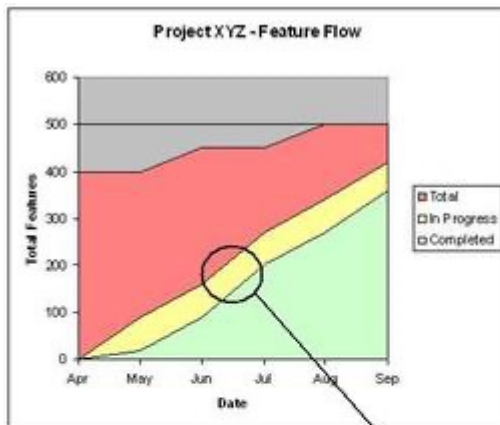
SLA

Throughput

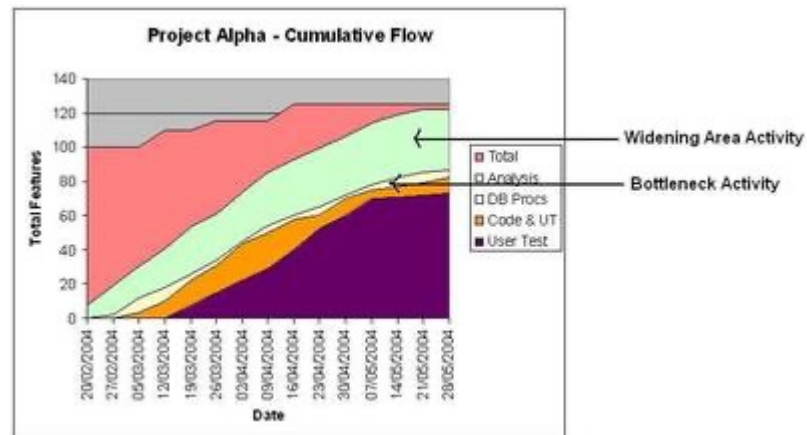
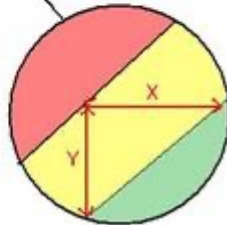
Cumulative Flow Diagrams

Capability Measurements

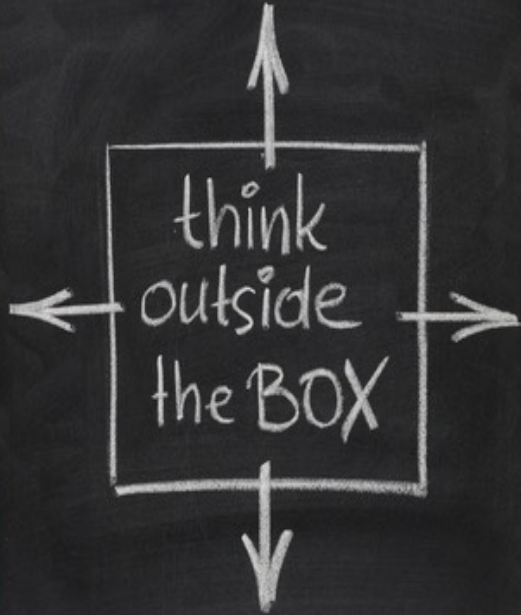
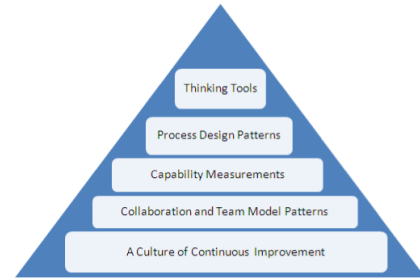
Cumulative Flow Diagrams bring WIP and bottlenecks to the throughput analysis



Y = Queue Length (units)
X = Queue Duration (time)



To Establish a Culture for Continuous Improvement



- ✓ When doing Operation Reviews
- ✓ When trying to enable CI Actions
- ✓ By expanding opportunities for Improvements

- ☐ Bottlenecks
- ☐ Waste Elimination
- ☐ Variability Reduction

Thank you!

Read more...

Limited WIP Society

<http://limitedwipsociety.org>

Blog Articles

<http://alissonvale.com/englishblog>

Kanban: When Signalization Matters

alissonvale.com/englishblog/post/Kanban-When-Signalization-Matters.aspx

The History of a Kanban System (Portuguese)

[http:// alissonvale.com/englishblog/post/A-Historia-de-um-Sistema-Kanban.aspx](http://alissonvale.com/englishblog/post/A-Historia-de-um-Sistema-Kanban.aspx)

Interview on InfoQ Brazil (Portuguese)

<http://www.infoq.com/br/news/2009/01/brasil-representacao-conferencia>

Contact

Mail: alisson.vale@phidelis.com.br

Blog: <http://alissonvale.com/englishblog>

Twitter: <http://twitter.com/alissonvale>