Percentage of scope complete

Approach:
* Traditional
* Adaptive (with fixed scope)

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project

Earned value

Approach:
* Traditional

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project

Steering | **Improvement**

Question(s) answered
• Are we on track to complete the planned scope on schedule?
Description
• The amount of planned work that has been completed as of the reporting date
Value
• Early warning of potential delivery risk
Success factors
• The initial definition of 100% of scope is firm and complete.
• The budget and/or schedule may be flexible.

Steering | **Improvement**

Question(s) answered
• Are we on track to complete the planned scope on schedule and within the allocated budget?
Description
• The amount of budgeted cost that has been used up as of the reporting date
Value
• Early warning of potential cost and/or schedule variance
Success factors
• The initial definition of 100% of scope, schedule, and budget are firm and complete.

Budget burn

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project

Buffer burn rate

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project

Steering | **Improvement**

Question(s) answered
• Do we have enough money to complete the planned work on schedule?
Description
• Predicted budget performance based on actual spending to date
Value
• Warning of potential cost overrun
Success factors
• The total budget for the project or for a distinct phase or release is allocated in advance—that is, any sort of funding model other than a recurring expense budget.

Steering | **Improvement**

Question(s) answered
Will we exceed our planning buffer before we run out of time?
Description
• Monitor the burn rate of the planning buffer.
• Look for trends that indicate emerging delivery risks.
Value
• Early warning of potential delivery risks
Success factors
• No special success factors

Running tested features

Approach:
* Adaptive

Process model:
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project

Earned business value

Approach:
* Adaptive

Process model:
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project

Steering

Question(s) answered

• How many of the planned features of the solution are in a production-ready state?
• Are we creating regressions (breaking previously working code) as we deploy new features?
• Are we likely to complete sufficient functionality on schedule to provide enough business value to justify continuing the project?
• How much time will we need to complete a given set of features for the new solution?

Description

• A simple count of the software features that have been or could be deployed to production. It's a forward-facing metric.

Value

• Provides a mechanism to track progress toward the project goal when there's no firm definition of 100% of scope

Success factors

• Throughout development, the team delivers subsets of the solution incrementally to a target environment where the features are exercised regularly using automated tests.

Steering continued

• The team uses automated test cases at multiple levels of abstraction to ensure that the features complete to date are functioning properly and that updates to the code base haven't broken previously working features.

Steering

Question(s) answered

• What proportion of the anticipated business value has been delivered to date?
• Have we achieved the goals of the project well enough to declare victory and move on?
• Is it worth the cost to continue developing the remaining features?
• Are we focusing on the highest-value features of the solution?

Description

• Tracks the relative amount of planned business value that has been delivered to date

Value

• Provides a mechanism to monitor business value delivery when there's no comprehensive up-front plan

Success factors

• Active involvement of key stakeholder(s) with continue/terminate decision-making authority
• The relative anticipated business value of each feature is assigned by key stakeholder(s) when the feature is defined.

Improvement

Velocity

Approach:
* Traditional
* Adaptive

Process model:
* Time-boxed

Delivery mode:
* Project

Cycle time

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project
* Ongoing

Steering

Question(s) answered
• What is the average delivery capacity of the team per unit of time?
• Is the team delivering at a steady rate?
Description
• Empirical measurement of the quantity of work the team delivers per unit of time, for forward-facing steering
Value
• Provides a trailing indicator of variation in the team's delivery performance
• Provides data points to create leading indicators to predict the length of time the team will need to complete a given scope or the amount of scope the team can deliver in a given length of time
Success factors
• The team completes some number of production-ready units of work per time-boxed iteration.
• The team sizes or estimates work items using a consistent scheme and scale throughout the project. This need not be (and usually isn't) comparable to the schemes and scales used by other teams.

Improvement

Question(s) answered
• Is the team delivering production-ready solution increments in each time-boxed iteration?
• Is the team's delivery rate consistent and predictable?
Description
• Quantity of work completed per time-boxed iteration
Value
• Reducing variation in velocity improves planning predictability
• Ensuring that production-ready solution increments are delivered in each iteration maximizes the business value delivered.
Success factors
• Proper use of a time-boxed iterative process model, fixed-length iterations, production-ready solution increments delivered in each iteration.

Steering

Question(s) answered
• What is the mean time needed to complete a single work item (possibly by category)?
• How consistent is the team's delivery performance?
• Which work items might have common characteristics that lead to delivery problems?
Description
• Projection of the team's likely future delivery performance based on empirical measurement
Value
• Provides a leading indicator of the team's delivery performance:
    • For backward-facing tracking of compliance with the plan (traditional development)
    • For forward-facing steering toward the project vision (adaptive development)
    • For capacity planning in ongoing support situations
• Can provide early warning of potential delivery risks, for either traditional or adaptive development
• Can help distinguish between common-cause variation and special-cause variation in task completion times, for purposes of process improvement
Success factors
• Consistent definition of the start and end of each category of work item.

Improvement

Question(s) answered
• What is the range of common-cause variation in the mean time to complete work items?
• How frequent are special-cause variations in mean completion time?
• What effect have process improvement efforts had on cycle time?
Description
• Mean time to complete a work item
Value
• Reducing variation in cycle time improves planning predictability.
• Reducing variation in cycle time improves flow, which improves throughput and reduces waste.
• Reducing mean cycle time reduces time to market.
• Reducing mean cycle time increases throughput.
• Special-cause variation highlights opportunities for improvement in team practices.
• Common-cause variation highlights opportunities for systemic improvement.
Success factors
• Consistent definition of the start and end of each category of work item

Burn chart

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project

Throughput

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project
* Ongoing

Steering

Question(s) answered
• Is the team likely to meet delivery targets?
• How much time will the team require to complete the planned scope?
• How much of the planned scope can the team complete by a given date?
Description
• Projection of the team's likely future delivery performance based on empirical measurement, for forward-facing or backward-facing steering
Value
• Provides a leading indicator of the team's delivery performance
• Can provide an early warning of potential delivery risks
Success factors
• Consistent understanding of what constitutes a "work item" (by whatever name)
• Explicit, demonstrable, binary definition of what it means to declare a work item "complete"

Improvement

Question(s) answered
• Is the team moving work items through the process smoothly?
Description
• Indicates whether the team is piling up incomplete work and then scrambling to complete it at the end of a development cadence or iteration
Value
• Can help identify appropriate WIP limits to promote continuous flow
Success factors
• Consistent understanding of what constitutes a work item (by whatever name)
• Explicit, demonstrable, binary definition of what it means to declare a work item complete

Steering

Question(s) answered
• How much software can the team or organization deliver in a given time?
• Does the team or organization deliver results at a consistent rate?
Description
• Empirical observation of the quantity of product delivered and available to customers per unit of time (per month, quarter, release, and so on)
Value
• Projections based on historical observations of throughput provide an accurate forecast of future delivery performance.
• If stakeholders understand the financial value of software features, they can use throughput to forecast revenue.
Success factors
• A realistic and honest definition of "delivered." Deployment to a staging or test environment isn't sufficient, because customers can't access the product there.
Consistent tracking of cycle time

Improvement

Cumulative flow

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project
* Ongoing

Process cycle efficiency

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project
* Ongoing

Steering

Question(s) answered
• Where are the bottlenecks in the process?
• At what points do you have a buildup of work-in-process inventory (interim artifacts that represent incomplete work)?
• How deep are the queues feeding into value-add steps?
• Where are the largest components of cycle time?
• At what points is the workload unbalanced?
Description
• Visual representation of all the work done and in process to date
Value
• Exposes delivery issues and process-improvement opportunities at a glance
• Provides direction for root-cause analysis
Success factors
• Queues and value-add states are identified.
• Accurate tracking of cycle time per state
• Accurate tracking of queued times

Improvement

Question(s) answered
• Where is the bottleneck (also known as the constraint, per Theory of Constraints) in the process?
• Which segments of the process account for the greatest proportion of total lead time?
• Where does incomplete work pile up due to high WIP?
• Where is flow irregular due to low WIP?
Description
• Provides a visual indication of how smoothly the work flows through the process
Value
• Can point to segments of the process that are affected by resource availability
• Can indicate “bus number” problems where work waits for scarce skills
• Can help identify appropriate WIP limits to promote continuous flow
Success factors
• Consistent understanding of what constitutes a work item (by whatever name)
• Explicit, demonstrable, binary definition of what it means to declare a work item complete

Steering

Improvement

Question(s) answered
• Where is time being lost to non-value-add activity?
Description
• Shows the proportion of value-add time to total lead time
Value
• Highlights the time sinks in the process
• Can help identify appropriate WIP limits to promote continuous flow
Success factors
• Track value-add time and non-value-add time explicitly
• Pay attention to non-value-add time when work is in an active state, caused by waits and context-switching overhead

Version control history

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project
* Ongoing

Static code-analysis metrics

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project
* Ongoing

Steering **Improvement**

Question(s) answered
• Which files are modified most frequently?
• Which files have been checked out to make corrections or fixes on a recurring basis?
Description
• The history of commits made to the version control system
Value
• Points to areas of the code base that are frequently changed
• Helps you identify where to focus your efforts to achieve the highest payback
Success factors
• A version control system is in use.
• Team members are diligent about providing comments when they commit changes.

Steering **Improvement**

Question(s) answered
• Does the code have structural problems?
Description
• Software build systems usually include features to analyze the source code statically (without executing the code) to look for well-known structural problems.
Value
• Helps you focus technical debt reduction efforts in areas that are likely to yield payback
Success factors
• Static code-analysis features are installed and enabled in the automated build for the project.

Niko Niko calendar

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project
* Ongoing

Happiness index

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project
* Ongoing

Steering **Improvement**

Question(s) answered
• How does the team's emotional state change over time?
Description
• Based on a simple check-in once per day by each team member, the calendar tracks mood using just three states: positive, neutral, and negative. There's no in-depth psychological analysis.
Value
• Raises a warning about possible systemic issues that are affecting team morale
• Can sometimes provide earlier warning of delivery issues than process-oriented or technical metrics, because low morale usually leads to other problems
Success factors
• The team must voluntarily agree to participate in providing the data.

Steering **Improvement**

Question(s) answered
• How do team members feel about working here?
Description
• A rough indication of team morale based on team members' subjective rating of their own feelings about the work environment
Value
• Can detect the emotional impact of organizational problems before the root causes make themselves evident
• Can detect a trend of falling morale in time to prevent team collapse
Success factors
• Best when used in an organizational culture that ensures safety when staff members express less-than-positive feelings about the workplace
• When used in an unsafe organizational culture, inputs to the happiness index should be anonymous.

Balls in bowls

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project
* Ongoing

Health and happiness

Approach:
* Traditional
* Adaptive

Process model:
* Linear
* Iterative
* Time-boxed
* Continuous flow

Delivery mode:
* Project
* Ongoing

Steering

Improvement

Question(s) answered
• How do team members feel about working here?
Description
• Gives a rough indication of team morale based on team members' subjective rating of their own feelings about the work environment
Value
• Can provide a simple point-in-time reading of team morale
Success factors
• Best when used in an organizational culture that ensures safety when staff members express less-than-positive feelings about the workplace
• Not advised when the organizational culture is unsafe, because anyone can see who places red balls in the container

Steering

Improvement

Question(s) answered
• How do team members feel about their delivery performance and job satisfaction?
Description
• Provides a point-in-time indication of team members' subjective assessment of their own delivery performance (health) and job satisfaction (happiness). A series of observations can provide a trend in how the team feels about these factors over time.
Value
• Can raise a warning when improved delivery performance is achieved at the cost of team morale
• Can raise a warning when improved team morale doesn't lead to improved delivery performance
• Can indicate whether team members associate strong delivery performance with high job satisfaction
• Can indicate that the team is settling into a comfort zone without improving or maintaining delivery performance
Success factors
• In a safe organizational culture, team members can mark the chart openly, in full view of teammates. This can lead to constructive discussion of opportunities for improvement.
• In an unsafe organizational culture, a facilitator can collect anonymous scores for health and happiness and plot the points on the chart. This can lead to constructive team discussions without pointing at any individuals.