Measures of Agile at Organization Level

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Abstract: **Organizations are often faced with challenges related to producing organization level scaled agile metrics which can help measure the progress of agile transformation initiative in an organization, and assess the impact of agile transformation on program execution and delivery. There are many team level metrics in agile which are helpful at team level only and most cannot be scaled at Organization level. Also, the metrics must need to be customer/ business focused so business /customer / end user and stakeholders can relate to it, and understand the benefit of agile execution. Objective of this paper is to share the organization level agile metrics and measures which are customer focused, can be applied at team level, and scaled to organization level. This will provide a consistent way of measurement so comparisons can be drawn across delivery organizations both at team and organization level. IT industry will benefit from these metrics and measures as with these metrics organizations can measure the success of their agile transformation initiative, compare the health of agile execution across delivery organizations, and relate the benefits of Agile execution and agile transformation so business and customer can understand and appreciate it. These metrics have been experimented both at team and organization level based on which suggested targets are also shared for these metrics. Our aim is to further evaluate and evolve these metrics and measures.**

Keywords: **Agile, Scaled Agile Metrics, Organization Agile Measures, Agile Transformation, Organizational Metrics for Agile, Customer Focused Agile Metrics, Metrics, Measures.**

I. INTRODUCTION

This paper intends to share the organization level, customer focused metric and measures for Agile. Unlike standard Agile team level metrics these organization level metrics and measures can be applied at team level and scaled at program/product or delivery org (vertical in the organization) level. With that these metrics & measures will provide a way to measure the progress & impact of agile transformation initiative across organizations; will also provide a way to compare the impact of agile execution on programs/ products and organizations as it makes sense to business and/or customer.

Today's world is a data driven world looking for ways to measure the progress of initiatives that are run across orgs, and hence chance to evolve and improve further. Organizations also use this information to make decisions on initiatives like whether to make further investment in that direction or not. No business would continue to invest in a loss-making proposition.

There is also a view that what can't be measured, can't be improved! But then some would debate that metrics doesn't make sense for Agile; Have you faced this situation? No matter what your views may be, there is always a need for data that can be analyzed and put in understandable form to help make decision whether to continue doing whatever we are doing, or to take recourse and do things differently. That is why we are often asked for measures at different levels - team and organization.

Talking about team level agile measures, these could be straight forward and works well for individual teams, provides good insight and information to inspect, adapt and improve at team level. But if measures work well at team level, can same work well at organization level also? Can we scale team level metrics to organization level? Would that be the right thing to do? (Again, a never so ending debate. But even to prove that you would need some data and metrics). On top of that there could be a danger of measuring the wrong thing. Also it is equally dangerous to measure the right thing but interpreting it incorrectly.

So, what should we measure? How would you convince the leadership that investment made is making the difference - making existing customer happy or bringing new customers onboard or beat the competition? Should measuring something that makes sense for customer/end user would be thing right thing to do? Do we have any suggested targets available for these metrics?

From the study conducted by "Forrestor Consulting, 2017, USA", 61% of the respondents said, "defining better business-related metrics would help improve agile initiatives" [1].

So, all in all, we need to have the right metrics, which are business/customer focussed, works well at team level and can be scaled to organization level. Next section "organization level measures in agile" answer the above questions.

II. ORGANIZATION LEVEL MEASURES IN AGILE

This section talks about the business/ customer focused metrics and measures to: measure the progress of agile transformation at organization level; assess the impact of agile transformation on program execution and delivery; compare the progress of agile transformation and execution across delivery organizations. Also, certain targets are recommended for these metrics which are based on the historical results captured during 3 years of agile transformation.

A. Customer Satisfaction: Customer Satisfaction Surveys

Every business is customer centric so reaching out to stakeholders (customers, business or sponsors) to hear their voice and concerns would make sense. Conduct regular satisfaction surveys with relevant stakeholder of the program, product.

Get stakeholders inputs once a quarter on various parameters(categories) that customer/ business feels are of utmost importance e.g., - Business Value delivery, Quality, Timely support, Communication, Ease of dealing, Catering to changing requirement etc., and on overall satisfaction over program/ product execution and delivery.

Suggestions on survey: Keep 5-8 questions which are straight forward, to the point (relates to voice of customer) and simple to understand with clear objective. Keep an open question for feedback comments. Filling entire survey should not take more than 5-10 minutes. Surveys can be initiated post program execution or at major customer releases. Agile execution normally has multiple releases so doing surveys quarterly or at major release would be the appropriate opportunity to survey. Reach out to stakeholders to rate these survey questions on the scale of 1-5 (5 – Highly satisfied, 4-Satisfied, 3-Neutral, 2- Unsatisfied and 1 – Highly unsatisfied) or 3-point scale (3- Satisfied, 2- Neutral, 1-Not satisfied).

Derive satisfaction scores for each category at organization level by taking % of satisfied responses out of total responses, for the survey category, for all program/product surveys conducted for the organization. A yearly/ quarterly trend plot of % satisfaction score at individual category level (plot survey question/category score) for the organization/s will provide a view of where there is an improvement and where improvements are required. Refer to figure 1 below (sample data plot for illustration purpose) which shows the comparison of satisfaction scores, at individual category level across 2017 and 2018. A trend line plot of quarterly satisfaction score can also be done at each category level for the above-mentioned purpose.
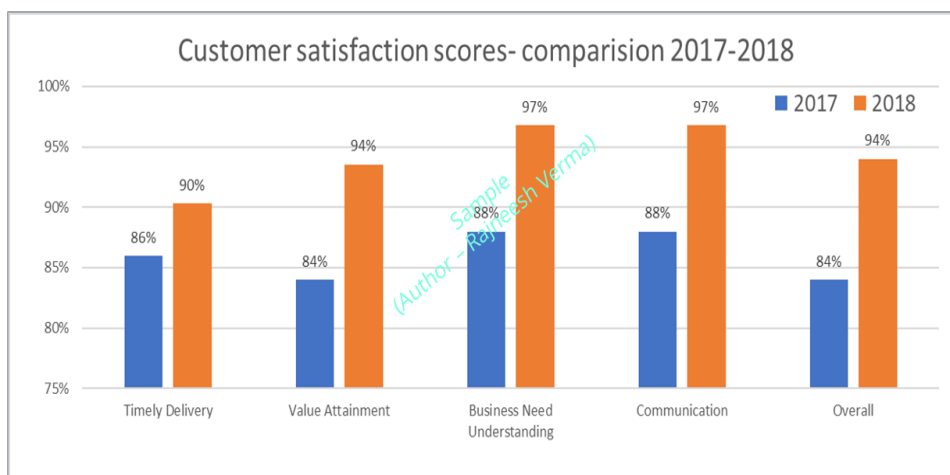

Figure 1: Yearly trend of customer satisfaction score at individual category level for an Organization

To get a comparative view of customer satisfaction across delivery organizations, plot overall % satisfaction score of individual organizations (can have multiple programs/products) and all organizations combined. Refer to figure 2- sample plot view for illustration purpose.
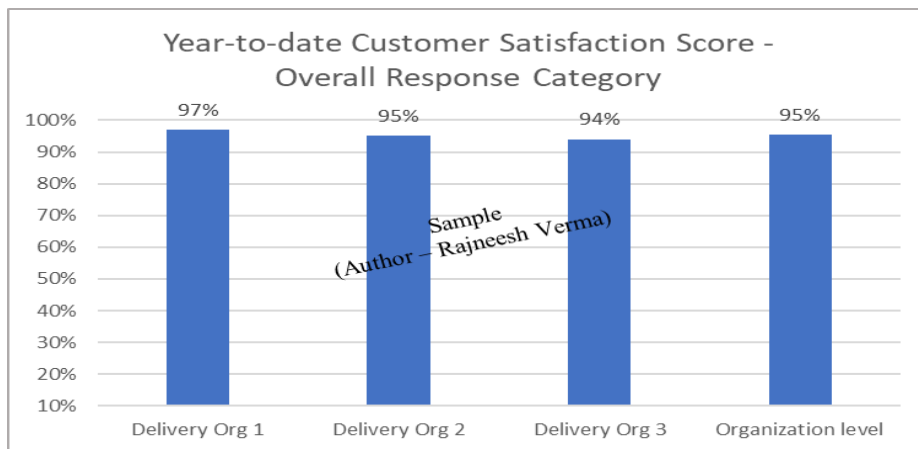

Figure 2: Comparison Customer satisfaction score across Organizations

Suggested target for customer satisfaction at individual category and overall satisfaction level is 90%. Applicable for products with multiple survey respondents (stakeholders) and for an organization with multiple programs/products surveyed. Derived based on historical results of surveys (86%, 88% and 91% in 2016, 2017 and 2018, respectively) conducted with different stakeholders. See figure below for actual results.
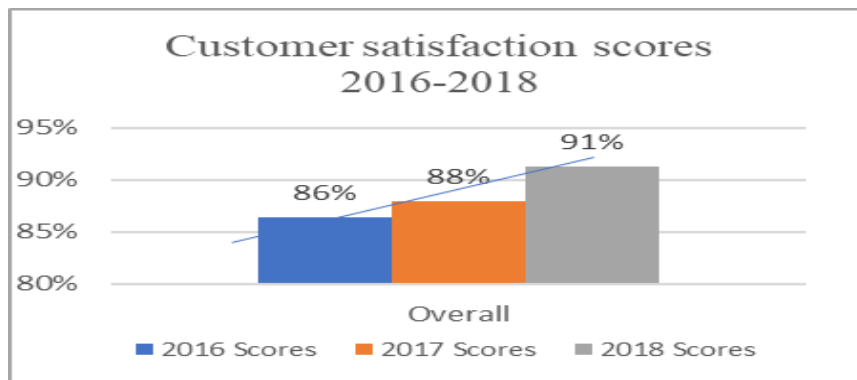

Figure 3: Actual customer satisfaction score 2016-2018

B. Quality: Escaped Defects Per Release

Since quality is non-negotiable aspect of product or solution. It matters to deliver quality product to customer. Measure the productions defects (escaped defects) found post release. Less the escaped defects better the quality of the product or solution delivered.

Measuring and comparing escaped defects (production defects) <u>only</u> may not make sense. Since escaped defects are not directly comparable as there could be different number of releases for a product/ program or an organization leading to that many escaped defects. If we relate the escaped defects with releases we will have metrics that is scalable and can be used for comparison of quality across products and organizations. Relate the number of production defects, of priority 1(critical priority) and 2(high priority), with number of releases to get an average number of production defects found per release. Priority of defect indicates the importance or urgency of fixing a defect.

Refer to Table 1 below which shows the sample year-to-date (cumulative) data (sample data for illustration purposes) on escaped defects and releases; and how to derive the average number of escaped defects per release. Example- for a team there are 4 releases and number of production defects found are 2, 1, 4, 0, respectively, across these 4 releases. Average escaped defects per release = (2+1+4+0)/4= 1.75. Similarly,e scale this metrics at program/product or at organization level (with multiple programs/products with multiple releases).

Table 1: Delivery org wise year-to-date(YTD) cumulative data on escaped defect and releases

Delivery Org		Quarter 1	Quarter 2	Quarter 3	Quarter 4
Delivery Org 1	Escaped defects YTD	4	9	15	23
	Releases YTD	5	9	16	30
	Escaped defects YTD / Release YTD	0.8	1.0	0.9	0.8
Delivery Org 2	Escaped defects YTD	8	20	27	54
	Releases YTD	4	12	20	42
	Escaped defects YTD / Release YTD	2.0	1.7	1.4	1.3
Delivery Org 3	Escaped defects YTD	20	40	55	70
	Releases YTD	13	30	45	65
	Escaped defects YTD / Release YTD	1.5	1.3	1.2	1.1
Organization level	Escaped defects YTD	34	68	100	156
	Releases YTD	27	38	60	96
	Escaped defects YTD / Release YTD	1.3	1.8	1.7	1.6
Target	Plan	1	1	1	1

Plot the trend to see how teams or organizations (can be various verticals with multiple programs/products practicing Agile) are faring in terms of delivering quality products. Plot the average escaped defects per release with respect to time(month/quarter) for multiple organizations to get (i) comparative view of quality in terms of "escaped defects per release" across organizations; (ii) trend view of how an organization is faring in terms of controlling escaped defects over a period. Refer to Figure 4 below - sample plot of average escaped defects per release at organization level.
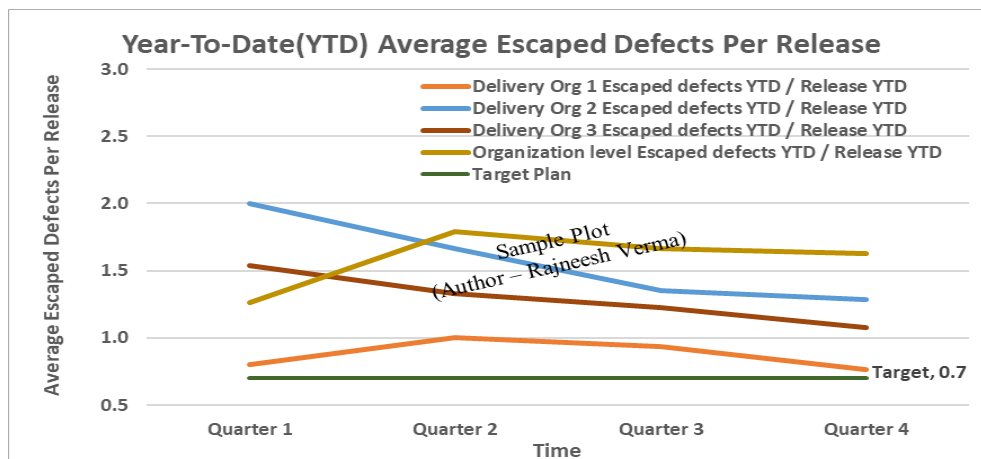

Figure 4: Year-to-date(YTD)trend of average escaped defects, with priority 1 and 2, per release or deployment.

Suggested target for this metrics is 0.8 escaped defects per release. This target is suggested based on three year (2016-18) historical results. See figure 5 below on actual data plotted for all orgs combined with average escaped defects per release as 1, 0.8 and 0.6 in 2016, 2017 and 2018 respectively. It is recommended to start with target of 1 escaped defect per release in first year of Agile transformation and gradually try and lower down the targets every year to try and achieve 'Zero' escaped defects per release.
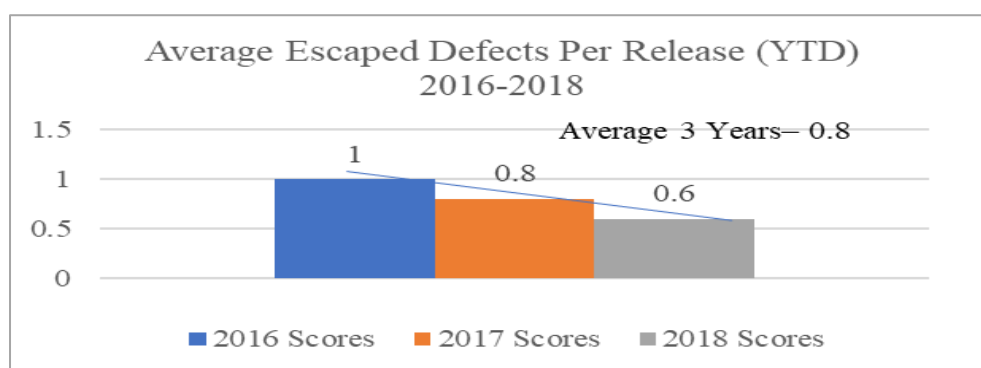

Figure 5: Actual average escaped defects per release 2016-2018

C. Speed-to-Market – Average number of months for a release**

How fast are we delivering the minimum viable product to our customers / end users? How frequently are we deploying workable solutions to production? These stats matter in today's agile world where the market is changing very fast with needs and wants of end user changing. Determine either the average frequency of releases (actual and outlooked/forecasted) to customer over program life cycle. Average these for multiple programs/ products to derive a score at organization level.

With further release planning exercises or PI planning (as prevalent in SAFe -Scaled Agile Framework for Agile) exercises, and new programs or products starting across the year, this average frequency of release may change every quarter. Multiple trend lines representing average frequency of release for different organizations (refer to figure 6 below) brings predictability. Quarterly trend of this "average number of months for a deployment" would tell us if speed-to-market is improving to help beat competition in market. Also, a quarterly comparison of actual vs planned releases would provide delivery fidelity (measure of variance in terms of actual releases done against planned releases) view.

Example: Org 1 has two products A and B with 5 and 8 releases, respectively, in last 4 months. So, at org level average time taken for a release will be (4/5 + 4/8)/2 = 0.65 months (19 days).
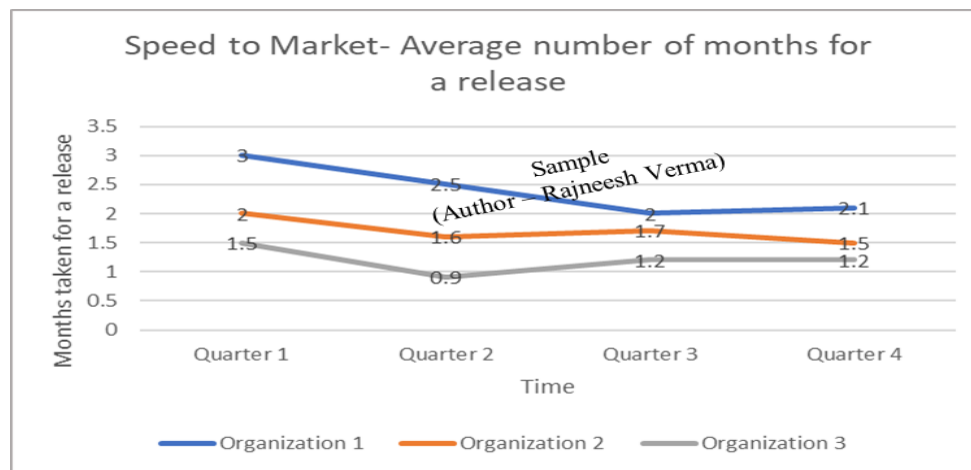

Figure 6: Trend chart on Average numbers of months for a release

Suggested target for this metrics for Agile releases (minimum viable product released to customer) is 2.5 months, 2.1 months and 0.9 months for a release in first, second and third year of agile transformation journey, respectively. Suggested target is applicable for an IT organization involved in delivering programs across different domains – retail, banking etc., and average program age varying from 5 to 14 months. See figure 7 below for actual historical values from 3 years (2016-2018).
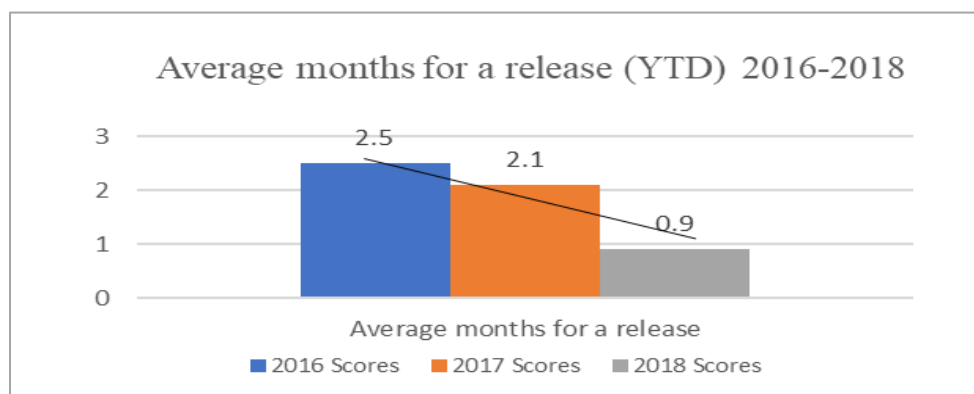

Figure 7: Actual number of months for a release over program life cycle (YTD) 2016-2018

** Deployment and release are two different things. With deployment it could be just deployed software into production which may or may not be released to end user/customer for use. Release means product or solution released to an end user

for use. Measure what makes sense to your organization. For such cases adjust the target of metrics accordingly based on your organization's experimental results obtained.

D. Business Value delivery

Delivering value to customer is of utmost importance. Not all work items (requirements/epics/ features/ stories) are created equal. 80% of the value typically resides in 20 % of the work items. 15% or so are ok but not as important and 65% provide little to no value, are rarely used [2].

Relate the business value of work items, in the backlog, in one of the following main categories [3] (customize categories per need in terms of what makes sense) and score same in terms of importance level (4-0) as below #:

- New Business (Business value- 4): every feature that will potentially bring new customers or new markets, fresh flow of money

- Up Sell (Business value- 3): every feature that will potentially bring money from existing customers and could be sold as add-on, upgrade or plug-in

- Retainment (Business value- 2): every feature that will avoid losing customers and will avoid the company losing money as well

- Operational Efficiency (Business value- 1): every feature that will allow the company to save money (costs) given a potential increase in any operation (installation, configuration, customization...)

- Others (Business value- 0)

Invite all stakeholders (market experts, customers, key account managers) to a meeting, generally time-boxed (2h-4h), where they will have to vote on the business value of each of the work items (epics / features/ user stories) available /defined in the product backlog (prioritized list of work items). Play "Business Value Game [3]" with stakeholders to link the above categories to the work items (features, user stories) in the product backlog.

Average the scores of business value delivered, linked to work items delivered/released, per release** to the customer/end user. Refer to table 2 for illustration. Plot the monthly or quarterly view of business value delivered (year to date) per month/ quarter or plot the trend of business value delivered per release (year to date) as illustrated below in figure 8 (plot with sample data). Relating business value delivered with releases will make it meaningful and comparable across products and organizations. Keep scale for business value (4 to 0 or other scale) same across the organizations (products and programs under the organization) to make business value delivery comparable across teams and organizations.

Table 2: Sample data on business value delivered and number of releases month wise

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Business Vertical 1 (Org 1)	Business value delivered (BV) monthly	50	80	55	60	50	35	40	56	50	60	55	70
	BV delivered Year to date (BV-YTD)	50	130	185	245	295	330	370	426	476	536	591	661
	Releases(Rel)	2	3	2	2	3	2	2	2	2	2	2	3
	Releases Year to date (Rel-YTD)	2	5	7	9	12	14	16	18	20	22	24	27
	Org 1- (BV-YTD) / (Rel-YTD)	25	26	26	27	25	24	23	24	24	24	25	24
Business Vertical 2 (Org 2)	Business value delivered (BV) monthly	67	35	45	45	67	78	76	37	44	66	67	76
	BV delivered Year to date (BV-YTD)	67	102	147	192	259	337	413	450	494	560	627	703
	Releases(Rel)	3	2	2	2	3	2	2	2	2	2	2	3
	Releases Year to date (Rel-YTD)	3	5	7	9	12	14	16	18	20	22	24	27
	Org 2- (BV-YTD) / (Rel-YTD)	22	20	21	21	22	24	26	25	25	25	26	26

Try and maximize the value delivery to customer and improve. Allow teams and organizations to mature over a period and set targets based on historical results obtained. Relating the business value point to dollars would provide the business value delivered in terms of dollars per release.

Target for metrics will depend on the scale used to derive the business value delivery. Maximize the delivery of work related to top three categories, in this case- New Business, Up Sell and Retainment, and that will maximize the delivery of value to customer. Experiment with metrics, let it stable and set target. Revise the targets every year to improve value delivery.
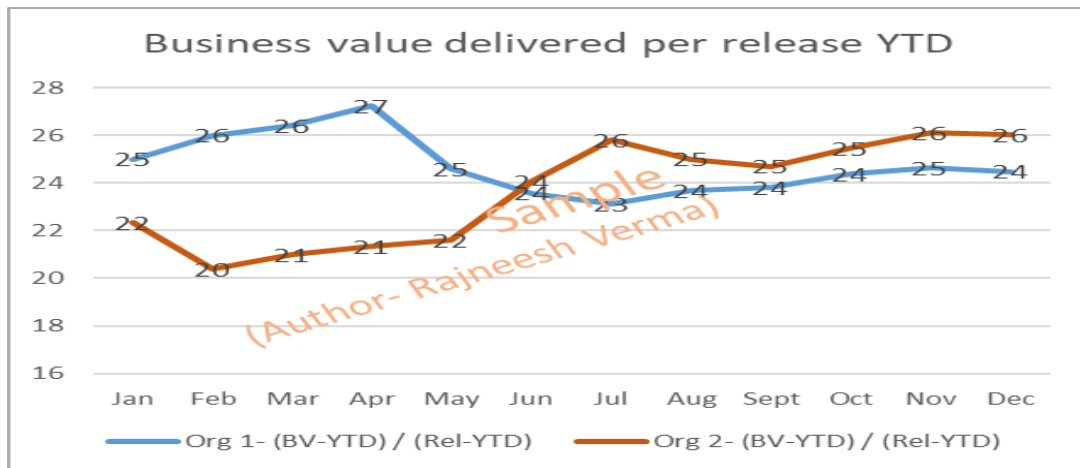
Figure 8: Plot of Year-to-date(YTD) Business value delivered per release

** Deployment and release are two different things. With deployment it could be just the deployed software into production which may or may not be released to end user/customer for use. Release means product or solution released to end user for use. Measure what makes sense to your organization. For such cases adjust the target of metrics accordingly.

E. Type of work delivered

Measure the type of work (feature/user story) completed/ delivered every release or at a set frequency – month or quarter. Type of work can be functional, architecture, infrastructure, tech debt, spike or documentation etc. Purpose of relating the type of work with release or time (month or quarter) will make it meaningful and comparable across programs/ products and organizations.

This metrics will provide following information:

o   Where the maximum effort of the team is being spent (delivering what type of work).

o   Trend on type of user stories delivered over the quarter/month will help us assess whether functional/ overhead- tech debt is growing/declining over the period.

For customer, functional work is important. Team may be building up the tech debt or documentation. So, release wise or quarterly trend of this metric will help provide insight on where to take corrective action to reduce the tech debt and overheads and improve efficiency and deliver maximum work that makes sense to customer. Refer to figure 9 for sample plot.
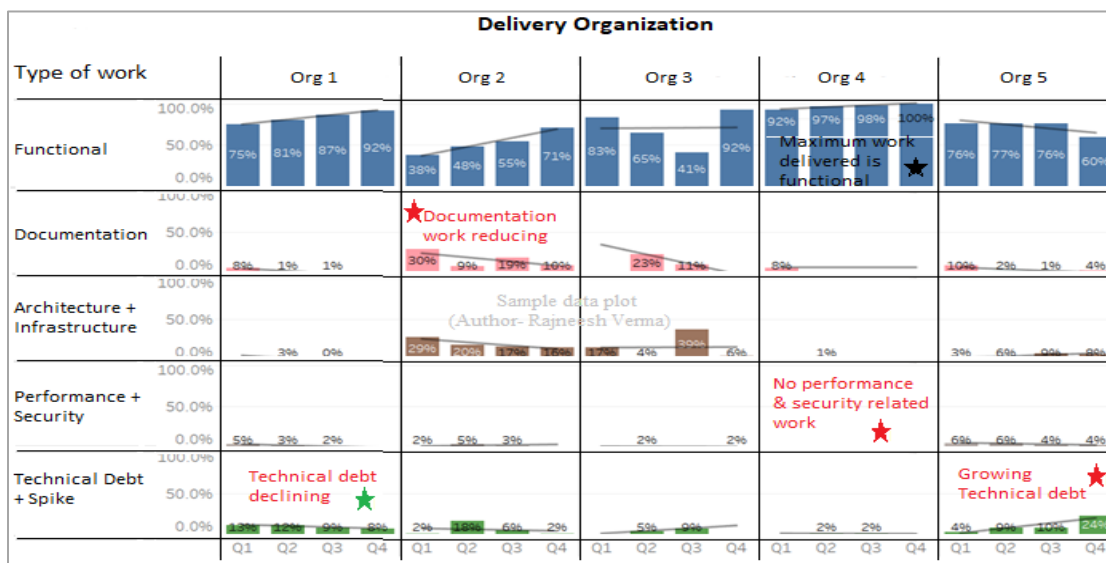

Figure 9: % of type of work delivered quarterly at different organization level(Sample plot)

Suggested target- On an average 65 % to 75% of the work completed per release (may consist of multiple sprints) or over a period (month, quarter or year) should be functional. Overhead like tech debt and spike should not exceed 7%-10% of the total work delivered over the period. Similarly, documentation related work-user stories should be under 7-10 %. Whereas architecture and infra related work can be 10-15 % of the total work completed over a period. Try and maximize the functional work delivery to customer and improve over the time. Allow teams and organization to mature over a period and set targets based on the historical results obtained. Experiment with metrics to try and reduce the overhead and channelize the energy and effort of team towards delivering the type of work that matters to customer/end user. Refer to figure 10- actual 2018 data for all organizations combined showing % of work type delivered out of total work delivered in that quarter.
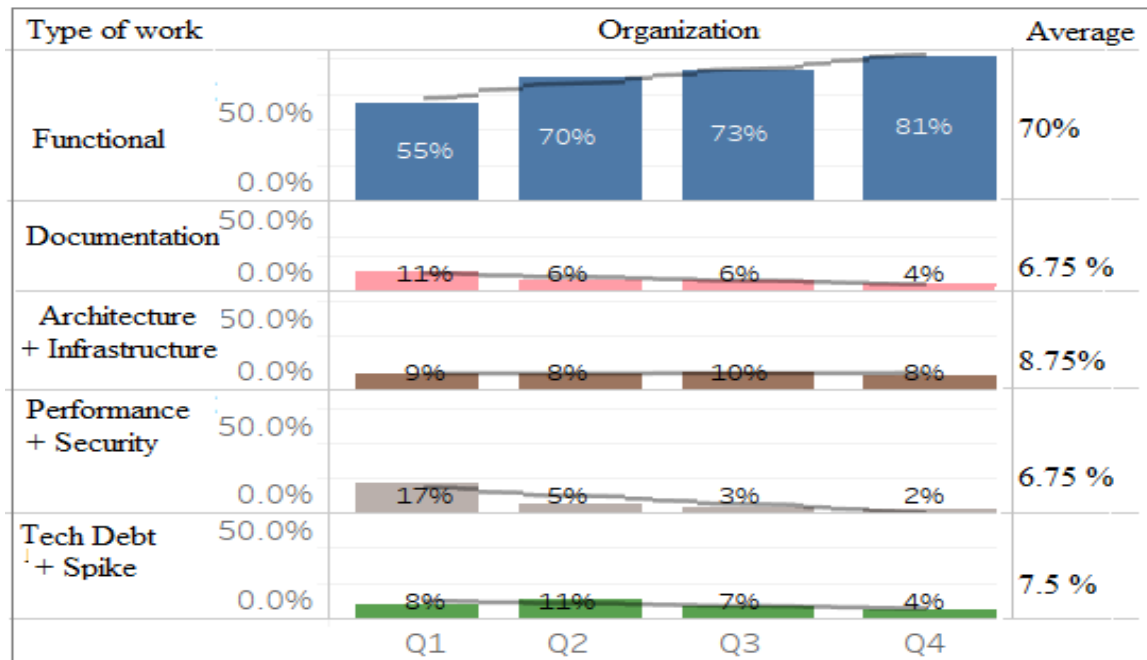

Figure 10: Actual data 2018- % of type of work delivered quarterly combined for all organizations

III. CONCLUSION

The proposed customer focused, organization level agile metrics and measures intend to provide a way of measuring the success of agile transformation initiative run across organizations. The benefit of these metrics is multi fold: (i) to help assess the impact of agile transformation at team and organization level (ii) provide a way to compare the progress of agile initiatives at different organizations. (iii) help relate the impact of agile transformation in terms of benefits to customer/ business. (iv) provide a visual way of communicating the value of agile execution to customer/ business.

Caution, to users of these metrics and measure, is to be careful in the way data is collected and interpreted. Proposed targets in section II of this paper are based on the historical results of the standard programs, executed using agile, related to various domains such as banking, retail, etc. where life of programs varied between 5 to 14 months. It is recommended to experiment with these metrics and record the results to derive a baseline/benchmark for your organization. Trend plot of these experimental results will provide an insight on whether there is an improvement as compared to the past executions. These insights can then be used to take corrective actions to improve speed-to-market, quality of the products / solutions, and value delivery to the customer.

These metrics should not be limited to IT organization but can be applied to other industries experimenting with agile. Also, these metrics can be used irrespective of the agile methodology (Scrum or Kanban or any other) being practiced at team level.

These metrics can also be used to draw comparison between waterfall, iterative and agile executed programs.

IV. ACKNOWLEDGEMENT

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