Capacity Management Chronicles:
What I learned in my first 10 years as a global consultant

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ABSTRACT

Mr. Andrea Vasco, Head of Operations, Movìri Inc recently celebrated his first 10 years in the Capacity Management business, and takes this opportunity to summarize his lessons learned during this amazing ride across three continents, 30+ world-class organizations, 50+ different major cities, and ten or so market segments.

The exodus to distributed systems and open source software, the virtualization wave, the flash storage revolution, the mobile disruption, the rise of the cloud, the data becoming big and services shrinking to micro, and the promised land of AI Ops: a lot have changed and the rate of change will never be this slow again. Curiosity and drive are distinctive mindset features of all the successful individuals I have met in the industry around the globe. And despite how different the organizations may appear, capacity management problems, questions, and topics are always there to be addressed, no matter where you are.

What does it take to become effective capacity managers? Well, let me share what I have learned over the last 10 years as a global consultant.

NO MAGIC, JUST COMMITMENT

"There's no abiding success without commitment." - Tony Robbins

There are no shortcuts to success, unfortunately. I have helped organizations impacted by structural, cultural and strategic deficiency find their way to value, as they were driven by an immovable will to succeed; at the same time, I have never seen an organization with lack of commitment being successful at Capacity Management, no matter the resources they may have had at their disposal.

Commitment brings the strive to learn something new, every day; the will to embrace a new challenge as an opportunity to grow and improve; the attitude to seek and recognize the value in everything you do.

Many times as consultants we face realities where there is clearly no will to partner up and investigate the problem we have at hand thoroughly; we call it the "do capacity button" approach, and by that we mean an attitude where the individual decides to give up their ability to argue about tools and techniques that may be employed in lieu of a magic *one size fits all* approach, calling themselves out from any kind of criticism about the quality of the proposed results and solutions – *"Don't look at me: the software, not me, returned this result; I have no idea if it's right or wrong"*.

Lack of ownership and accountability is generally a good indicator of poor commitment, and as it was stated a few lines above, poor commitment brings nothing but a troubled and likely failed process – this being Capacity Management of whatever other function you may think of.

On the other hand, no process can be effective if it is not contextualized in the specific reality at hand; in the next few sections, I will share a quick reference framework to start your journey towards success.

ASSESS, PRIORITIZE, PLAN

"Stop setting goals. Goals are pure fantasy unless you have a specific plan to achieve them." - Stephen Covey

One of the most valuable uses of time and effort is to run an in-depth assessment of the whole Capacity Management function in your organization every few years – in case you are lacking an *ad-hoc* governance and continual improvement process, as we will see soon in an upcoming section.

The assessment should provide you clear understanding about a set of key questions, such as:

- What are the goals and responsibilities of Capacity Management?
- What portfolio of services should the capacity management process offer the back to the organization?
- What skills are available, and more importantly what skills may be lacking?
- What data is available, and what is the quality of it?
- Are the processes, tools and techniques in place capable of supporting the vision?
- What are the most important priorities in the organization? What are the quick wins, and what are the nice to haves?
- What are the actors, the roles, and the responsibilities within the capacity management function?

An honest assessment, together with an agreed prioritization, will eventually provide a roadmap to follow, an instruction manual to success, designed around what is important *for the organization*. It will help you define success, measure it, evaluate the impact of every choice, and provide a business justification to potential work you may require from external teams.

And last, a solid implementation roadmap will allow you to avoid distractions. Way too many times for my liking I was presented with requests backed up by little or no technical or business justification (e.g. "I want to import Capacity information at the microsecond resolution"), that resulted in frustration, poor value, no efficiency; on the other hand every single Capacity Management initiative I worked on that was backed up by a solid assessment always resulted in a stellar success, recognition of quality and value with flying colors, appreciation by the executive levels – that sometimes leads to a hiring proposals with pretty impressive terms, but that's another story.

Below, I provide a simplified reference scoresheet of a set of typical required capabilities that should always be considered while running a Capacity Management process. Honest assessment is the first step in creating or improving a capacity management discipline. Use your own scoring method.

Maturity Score	Family	Feature or Capability
	Data Collection	Automated agent-based or agent-less data integration
	Data Collection	Automated reconciliation across different data sources
	Data Collection	Automated auto-discovery of new entities
	Data Collection	Data collection black/white listing
	Data Collection	Extensible metric portfolio
	Data Collection	Open data model
	Data Collection	Automated data rollup and purging
	Data Collection	Ability to manage performance metrics
	Data Collection	Ability to manage configuration information
	Data Collection	Ability to manage service models and relations from sources like CMDB
	Data Collection	Ability to manage demand information
	Data Collection	Ability to derive metrics as combination of existing ones
	Data Collection	Ability to derive entities as combination of existing ones
	Data Collection	Ability to derive and manage standard statistics (Min, Max, Avg)
	Data Collection	Ability to derive and manage advanced statistics (percentiles, custom baselines)
	Monitoring	Set fixed thresholds
	Monitoring	Set dynamic thresholds, based on baselines

Maturity Score	Family	Feature or Capability
	Monitoring	Compare component data with thresholds
	Monitoring	Compare component data with baselines
	Monitoring	Compare service data with thresholds
	Monitoring	Compare service data with baselines
	Monitoring	Centralized and Distributed Threshold Management
	Analytics	Time Analysis (Performance, Configuration, Business, Mixed)
	Analytics	Profile Analysis (Performance, Configuration, Business, Mixed)
	Analytics	Aggregated Analysis (Performance, Configuration, Business, Mixed)
	Analytics	Trending Analysis
	Analytics	Correlation analysis (Performance vs Performance)
	Analytics	Correlation analysis (Business vs Business)
	Analytics	Correlation analysis (Performance vs Business)
	Analytics	Peak to average analysis
	Analytics	Peak to total analysis
	Analytics	Identification of peak periods
	Analytics	Identification of seasonality
	Analytics	Identification of bottlenecks at application level
	Analytics	Fixed and Dynamic time filtering
	Analytics	Fixed and Dynamic entity filtering
	Analytics	Fixed and Dynamic entity tagging
	Reporting	Heat Maps
	Reporting	Interactive Dashboard
	Reporting	Standard report templates
	Reporting	Configurable report templates
	Reporting	Show-back reporting
	Reporting	Exception reporting (vs threshold)
	Reporting	Exception reporting (vs baseline)
	Reporting	Ability to automatically create reports on demand or on exception
	Reporting	Ability to automatically send reports on a defined frequency
	Modeling	Linear and Non linear extrapolation model
	Modeling	Forecasting Model
	Modeling	Queuing networks model
	Modeling	Consolidation model
	Modeling	Accounting and Chargeback model
	Modeling	What-if scenarios
	Planning and Rightsizing	Ability to manage load testing results

Maturity Score	Family	Feature or Capability
	Planning and Rightsizing	Ability to manage virtual load testing results
	Planning and Rightsizing	Ability to identify candidates for consolidation
	Planning and Rightsizing	Ability to identify the optimal workload allocation
	Planning and Rightsizing	Ability to represent the available capacity factoring in the demand pipeline

Here is a simplified overview for a potential Capacity Management Portfolio of Services. These services should be the shopping list of services available from any capacity management effort. Maturity of the capacity management effort can be assessed by how many of these are offered and how completely the services are offered.

Pillar	Opportunity	Goal
Optimization	Lifecycle, Compliance, and Optimization	Visibility on Compliance status and Capacity Optimization, reclaim and repurposing opportunities
Reporting	Advanced data aggregation services	Derivation or computation of Advanced Statistics (e.g. Percentiles) or Derived metrics (e.g. aggregation of spare rack capacity for facilities)
	Baselines and utilization footprint evaluation	Evaluation of both Resource and Business Demand Baselines and Utilization Footprints
	Consolidation, Repurposing, and Rightsizing	Evaluate resource reclaim opportunities via Consolidation, Repurposing, or Rightsizing analyses
	Holistic and aggregated visibility	Evaluate the available capacity in a holistic (across platforms and tools) and aggregated
	Quality of Service and Exception	Assess and evaluate the current Quality of Service KPIs and set up specific exception reporting (over threshold, over baseline)
	Trending and Saturation	Evaluation of both Resource and Business Demand trending and forecasting models, predicting saturation of resources and other useful indicators (e.g. Days to Saturation)
Modelling	Service Capacity Planning	Produce and holistic and Service-specific Capacity Planning study
	Threshold and Load Testing	Leverage Load Testing campaigns to re-calibrate existing Service Capacity models and update existing Thresholds and / or SLA/OLAs
Cost Transparency	Chargeback and Utilization Show-Back	Improve visibility on the IT infrastructure utilization via Chargeback models and Utilization/other KPIs (e.g. number of incidents) Show-back analysis
Demand & Provisioning	Demand pipeline visibility and impact prediction	Improve visibility on the actual Demand pipeline and its impact on the existent IT infrastructure
	Provisioning feasibility evaluation and optimization	Provide improved visibility on the ongoing Provisioning process activity and its impact on the existent IT infrastructure

MEASURE THE PERFORMANCE

"If you can't measure it, you cannot improve it" – Lord Kelvin

No function can run effectively if there are no means to measure its effectiveness in an objective, agreed, repeatable way. The KPIs – *Key Performance Indicators* – of the process should be generally identified during the assessment phase, and that is generally the case; on the contrary, the discipline to keep a solid track of them is unfortunately lacking way too many times.

If you cannot reasonably provide information about how many capacity incidents your organization is managing, what is the trend of these incidents and any possible seasonality, what are the areas mostly effected from a revenue perspective (either direct or indirect in terms of resolution timings), how many reports are produced on the daily basis and to whom are sent, how many alerts are proactively triggered, and so on... well chances are you are experiencing a lack of measuring your Capacity Management process KPIs. Below, I provide a simplified, reference framework for KPIs you may consider tracking.

Data Inputs KPIs
These indicators refer to the overall performance of the baseline information used to produce intelligence.

KPI	Description
# Data degradation events	The number of poor quality data events
# Data disruption events	The number of data continuity disruption events
# Maintenance activities	The number of events when the asset was unreachable or unavailable

Operational KPIs
These indicators refer to the overall effectiveness of tools, procedures, and techniques used to produce intelligence.

KPI	Description
# Monitored Assets	Number of assets monitored by Capacity Management, by type
% Monitored Assets	Number of assets monitored by Capacity Management over CMDB or equivalent, in percentage, by type
# Integrated Data Inputs	Number of integrated Data Inputs, by scope
% Integrated Data Inputs	Number of integrated Data Inputs over total available, in percentage, by scope
# Capabilities	Number of leveraged Capabilities, by Family
% Capabilities	Number of leveraged Capabilities over total available, in percentage, by Family

Service KPIs
These indicators refer to the overall effectiveness of the capacity reporting artifacts used to express the gathered intelligence.

KPI	Description
# Capacity Service Requests	Number of Capacity Service Requests, by type
# On Demand Reports	Number of reports provided on demand (no regular execution)
# Scheduled Reports	Number of reports scheduled for regular execution
# Dashboards	Number of dashboards deployed for the end customer
# Capacity incidents	Number of incidents due to capacity shortages, poorly planned changes, requests that needed escalation

# Reclaimed/Decommissioned/repurposed assets	Number of assets that got decommissioned or repurposed, optionally exposed as economical value

CLOSE THE LOOP OR FAIL

"Excellent firms don't believe in excellence - only in constant improvement and constant change." – Tom Peters

The remarkable effort of defining and pursuing a roadmap, and measuring Capacity Management KPIs becomes totally worthless if there is no control sub-process closing the ideal action loop. A Continual Improvement sub-process is simply paramount to realize value, adapt to the changes, and ensure a consistent stream of reliable, actionable intelligence back to the organization.

If a little few organizations invest in tracking process KPIs, an even smaller number will eventually make use of that precious piece of information to make informed, value driven decisions. That is an own goal of massive proportions, as most of the work is already being done and the data is available very little additional effort is required to unlock this value.

A Continual Improvement Sub-process should aim at providing directions and actions about topics as:
* Data quality improvement: identify what sources are providing insufficient data quality, and mitigation of their negative effects.
* Operational effectiveness: identify skills, sources, capabilities, toolsets that should be onboarded or developed to provide a more efficient service to the Organization
* Service effectiveness: identify areas and scopes where the current Capacity Management capabilities are underperforming and provide a mitigation plan, consolidate and simplify the reporting offering, track and control the overall Service effectiveness

Last, a Continual Improvement sub-process will ensure the alignment between the Capacity Management process and the overall Company strategies, by driving the necessary changes – e.g. collection of new kind of data, development of new skills or capabilities, expansion of the reporting portfolio

CONCLUSION: BRINGING IT ALL TOGETHER

"Tell me and I forget. Teach me and I remember. Involve me and I learn." - Benjamin Franklin

Organizations that succeed	Organizations that fail
Empower the process and commit resources to it.	Lack strategy, accountability and vision
Assess, prioritize, plan and execute.	Keep a reactive approach, cannot articulate value and business justification of their initiative
Define and track process KPIs	Have little means to objectively define the process efficiency
Take value driven actions in a continual improvement approach	Kick off initiatives and let them extinguish

In my 10 plus years I find that this is what I wish in knew and understood then. This is offered as a well matured starting point for a capacity management effort or for a capacity management maturity effort.

Of course, your goals, data, objectives and business requirements may move the emphasis from one area to another, but this checklist / framework will help you organize your self-assessment.

We would be happy to help evaluate, design and / or implement a capacity management improvement effort.