



Michelsen Project Consulting ApS

Project Management

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Company - Charter

Product Development Projects

5000 Employee,

800M\$ Revenue

Michelsen Project Consulting ApS

Overview

This charter is primarily concerned with Company New Product Development (NPD) projects.

The Charter has been divided into following sections;

- **Current State** – describing present situation
- **Future State** – describing which values and ambitions should rule
- **Bridging** – describing the activities, setting the frameworks (financial, behavioral culture, market penetration) to move from current state to future state
- **Implementation** – activities, and ownership moving the NPD performance towards the future state

Current State

Current State interviews;

- Doug ; CEO
- Ryan ; VP R&D Engineering
- Bill ; VP Operations Excellence
- Hiroshi ; Responsible for Marketing and Communications
- Robert ; Platform Director Variable Speed
- Khalid ; Director Project Management
- Francois ; MD Europe
- Ricardo ; MD Brazil
- Jegapriyan ; MD India

Current State

Observations – NPD high level;

- Monthly Strategic Compressor Roadmap Review, with purpose to determine if need for any new strategic decision, what is the precise role of MSCRR?
- MPR (monthly project review) on 2019 selected global critical NPD's, what is the precise role of MPR?
- For 2019, global critical NPD's have been selected ensuring high level focus, understanding and timing.
- Regional NPD's are often not included in MRP (Monthly Project Review) i.e. European condensing unit
- NPD projects are running in a regional/global matrix organization
- Can we articulate our Strategy for what NPD's are running

Current State

- Observations - Project Governance Structure (backbone);
- To reduce risk in projects, NTD (New Technology Development) workstream has been introduced, handling the maturing of new technologies (NTD committee exists)
- Overall Project Governance Structure, describing responsibilities between Projects and Line Functions (not) available
- NPD/NPD2 workstream handles the deliverables, responsibilities, along the gate structure
 - Weak implementation (usage applied differently, PM ability to see the big picture)
 - No deliverables available at (R1-G3) securing early market launch planning
 - No approval structure for deliverables, to secure evidence of implementation

Current State

- Observations - Project Governance Structure (backbone);
 - Sharepoint site for standardized deliverables implemented, opportunity to develop deliverables and templates further

Current State

Observations – Project Management;

- Project Management is reporting to R&D
 - Project Management Function is an independent function in R&D
 - Project Management Function is headed by own Director
 - Project Manager/s in AA report has direct report
 - Project Managers in regions has direct report to regional MD's.
 - Regional projects competes on Global NPD projects
 - Poor communication from Regional Project Managers to Project Management Function (i.e. long response times seen)
 - Project Managers available (1in AA, 1 in India, 2 in France, 1 in Brazil)
 - Project Managers in regions are often skilled engineers appointed as Project Managers with little understanding of the global responsibility in leading projects, such as following NPD structure, securing cross functional deliverables timely and in adequate quality, evaluation of Business Case in the course of the project. Not seen as 'mini' CEO's for their projects.

Current State

Observations – Project Management;

- Scope Creepage
 - Scope creepage as to adding new/more product functionality/approbations requirements after having passed G3 is happening quite often, consequently delaying the G7(product launch)
- Business Case and CER (Capital Expense Request)
 - CER formally approved at G5, before investment in equipment takes place, BC formally approved at G3

Current State

Observations – Project Management;

- Missing confirmed orders at G7;
 - in reality this happens somewhere between G7 and G8, delaying sales ramp-up
 - Pilot orders are often started on internal orders leading to stocking instead of sales
 - The time between G7 and G8 are seen to take between 1-2 years as to missing orders.
 - Revisit definitions for G7, (synchronism of operations, order receipt, engineering release)

Current State

- Observations - Platform Management Function;
 - Platform management function secures the product strategy, hence what should be developed to which customers
 - Platform management secures that Program Objective Document is available before starting the project at G3.
 - Program Objective Document is subject to document revision
 - Program Objective Document is approved formally through Oracle routing (but signing value is questionable)
 - Program Objective Document approval process is not defined as to who and what is approved
 - Vague formulation on timing, sales price and sales volume in Program Objective Document
 - Platform management responsible for developing the initial Business Case, with the input from regional sales directors.
 - Sales figures reduces significantly from G3 to G7

Current State

- Observations - Platform Management Function;
 - Platform Manager acts as VOC in projects
 - Product Launch is weak
 - Missing engagement with customers (commitment to partnering)
 - Samples are free to customers, however the usage/feedback of samples are done in very varying quality i.e. AHT runs on a high level whereas i.e. continental runs on very low level
 - Basically follow-up on samples at customers are not really happening
 - Product launch is not part of G3
 - It seems NPD projects are managed out of both Project Management area and Platform Management area – historical reasons ?

Current State

- Observations - Marketing;
 - Business Intelligence Structure under review
 - Today no total market overview exists, needs much more detailed understanding
 - Marketing in the learning process to access new markets
 - PFM acts as lifesaving link for getting the true market insight
 - Gathered market insights needs to be much better communicated within the organization, i.e. influencing the early phases of NPD projects
 - Cold Chain Market development happens now, Company need to position itself now.
 - Sales teams are mostly familiar with fixed speed compressors
 - Robert are doing a major effort to build up V-Speed knowhow in the sales teams
 - Lionel runs training initiatives to increase compressor knowhow among regional sales managers

Current State

- Observations – Marketing;
 - Product Data Management are inconsistent and lacking standardization (see separate page)
 - Sales forecast for NPD's are weak;
 - Each region differs in methodology on establishing sales figures
 - PFM's significantly reduces incoming sales figures from sales managers before entered into business case.
 - NPD projects needs much earlier input of Marketing;
 - Product Launch Activity Plan must be part of G3 at the latest – activities started with Jim B. a month ago
 - Service Agreement Plan (Systems for mini chiller) must be in place before G7, so customers are confident about service level offered

Current State

- Observations – Operations Excellence;
- New Model development (MR's Marketing Requests) are draining resources away from NPD's. BK noted that he has proposed the use of an New Model Development (NMD) process to cover the 80% of the actual overall engineering activities at TPC. Bill noted that Ryan broke the NTD out of the NPD and that has helped timing but we still need an NMD. Henning noted that his former employer had a similar process for model variants and that a large portion of the activities were consumed on these and related activities.
 - MR's are started by marketing and approved through a routing process
 - MR's are not subject to a Gate process to check value creation and risk involvement
 - No systematic follow up on the effect of starting MR's, in the sense value contribution to the company

Current State

- Observations – Operations Excellence;
 - Manufacturing Process Engineering involvement and direction setting in NPD projects BK: There is not formal Corporate Adv Mfg Eng, this function is performed somewhat by myself and then the Plant Mfg Eng do this function on the projects. Dave G (Corp QA) handles the corporate APQP is what was discussed.

Current State

- Observations – Product Data Management;
 - Product Data management are lacking standardization;
 - Local values used in global data sheets i.e. local Brazilian Ashrae values does not fit the Indian market, limiting market penetration
 - BOM (Bill Of Material) are not unique for same compressor/parts i.e. different BOM codes are used regionally
 - Influence on ability to create volume of scale in purchasing of parts
 - Oracle difference in BOM as result of the regional Oracle following the processes

Current State

Observations – Others;

- V-Speed development are divided into to specific responsibility areas
 - One for HH in Brazil
 - One for LC in AA
- V-Speed compressors so far are derived out of fixed speed compressors program

Current State

Observations – Others;

- MR Projects (Marketing Request);
 - Value creation of MR's are not measured
 - Running without business case, Project manager (local product engineers runs them)
 - Consuming significant amounts of resources
 - Shifting prioritization on weekly basis

Future State

?	Documentation & Processes	Organisational Changes	Communication Roles & Responsibility	Product Competitiveness
MD inputs must be secured	Business Development Process that forces strategy definition and deployment	Estimation of resourcing requirement to support existing product lines	Roles and responsibility between the regional MD's and Corporate on NPD / MR3 vs. MR1	Enhanced speed to market of new products (and more of them)
	Clearly defined and cascaded business strategy with which to check projects against (current strategy needs to be updated to today's thinking)	Resource owners (solid line) become accountable for NPD timing and success (or vice versa)	Roles of Sales / Marketing in process with deliverables	Clear management of pipeline 'ideas' before entering the formal process
	Timing for projects based on customer market needs – not resource availability	Ability to understand global resource constraints. Preventing launch of new products	Company becomes market driven, product are pulled by the market	Clear goal / strategy for the NTD / R&D to go after
	Objective measures of testing business case data validity – consultant strategy	New function org group (applications) responsible to engage customers to identify needs and secure requirement (technical, commercial, application)	Systematic collection and reporting on VOC, especially targeting top 20% of customers	Open innovation to generate dramatically more proposals
	Go to market and business case built with global standard template	Develop 'application' team/resources that are responsible for technical interaction / relationship of key customer	Higher level of collaboration and communication (cross region/cross department) to insure projects are properly <i>vetted</i> tracked	Marketing risk assessment on non-vapor-based refrigeration technology (M.I.)
	Standardised forecasting method in business case and for ongoing sales	Clear separation of NPD resources from sustaining resources/MR activities -> to ensure focus i.e project success	Reports (Dashboards) that are more descriptive of actual progress to milestones – today's reports are too qualitative and misleading	Early judgement on build vs buy (JV's partnership) and look for opportunities – integrated in BC
	Clear standard process for getting sales volume numbers for preliminary Business Case	Separate resources (people and equipment) for NPD and Sustaining	Consistent projects dashboards online / real-time	

Future State

?	Documentation & Processes	Organisational Changes	Communication Roles & Responsibility	Product Competitiveness
	Simple standard and globally adapted process to capture and manage, rank opportunities, for new product sales	All NPD projects run by project managers. No more engineer assigned at project leads		
	Concurrent NTD/NPD/NMD activity with product/process/supplychain	Strategic marketing capability developed (B.I., Market Intelligence) team can articulate and talk with data		
	NTD/NPD/NMD process that takes resources availability into account – current system assumes infinite	Standard definition i.e. Clear identification of what is needed by sales persons to have tools to sell and articulate value propositions		
	Project Execution excellence – consistency discipline – No significant regional (process) variations			
	NPD milestones and gates with clearly defined deliverables			
	Approval process place for (all?) deliverables			
	Well established Project Scope/business case. Deliverable			

Future State

?	Documentation & Processes	Organisational Changes	Communication Roles & Responsibility	Product Competitiveness
	Committee review of proposed projects; MR2 (no reliability test), M3/NPD (reliability test)			
	NPD deliverables to be condensed into to bigger approved deliverables			
	Improve upon our deliverables and templates			
	Clear definition how to categorize and manage every project			
	NMD process that is visible and tracked like NPD lite projects			
	Scope Creep Eliminated. Facilitating successful Project Launches			
	Better method to avoid (handle) scope creep			

Future State

?	Documentation & Processes	Organisational Changes	Communication Roles & Responsibility	Product Competitiveness
	Improved capability and process to bring customer cabinets / tests. Enlarge at cabinet test level to show / create value			
	Simple standard and globally adapted process for getting samples to customers and securing evaluation and feedback results			
	KPI's for selling new products			
	Sales after launch (1st year sales) agree with planned/committed			
	Find better way to the sales volume when product is launched			
	Ideally PLM for Key (System) activities			
	AAR – After Action Review of NTD, NPD, NMD, and MR's			
	Operational Strategy (incl branding			

Future State - Consolidated

?	Documentation & Processes	Organisational Changes	Communication Roles & Responsibility	Product Competitiveness
Resource management tool to manage HR and Lab	Market driven business strategy cascaded into operational elements, against which to decide on new project proposals	Clear separation of NPD resources from sustaining resources/MR & CU activities -> to ensure focus i.e project success	Company becomes market driven, product are pulled by the market	Enhanced speed to market of new products (and more of them)
	Global standardized process to capture and manage, rank opportunities, for new product sales	Resource owners (solid line) become accountable for resource estimation (function area) and NPD timing	Roles and responsibility between the regional MD's and Corporate on NPD / MR3 vs. MR1	Clear management of pipeline 'ideas' before entering the formal process
	Global standardised (template) forecasting methodology in business case and for ongoing sales, and accountability	Projects cannot pass G3 without approved resource plan (Global template)	Roles of Sales / Marketing in process with deliverables	
	Standardized pre-business case for NPD and NMD project proposals. Securing robust validation of sales figures and timing constraints	All NPD/NMD projects run by professional project managers, out of own global/regional function No more engineer assigned at project leads	Systematic collection and reporting on VOC, especially targeting top 20% of customers	Open innovation to generate dramatically more proposals
	Standardized business case for NPD and NMD project execution securing pre-business case take-over and updating + CER	Strategic marketing capability developed (B.I., Market Intelligence) team can articulate and talk with data	Higher level of collaboration and communication (cross region/cross department) to insure projects are properly <i>vetted</i> tracked	Marketing risk assessment on none-vapor-based refrigeration technology (M.I.)
	Concurrent global cross functional (Sales,S/C,R&D) standardized NPD/NMD processes with clearly	Strengthen S&M with application group responsible to engage	Reports (Dashboards) that are online descriptive of actual progress to	Early judgement on build vs buy (JV's partnership) and look for opportunities –

Future State - Consolidated

?	Documentation & Processes	Organisational Changes	Communication Roles & Responsibility	Product Competitiveness
	Clear definition how to categorize and manage NPD, NMD and MR projects. (NMD process that is visible and tracked like NPD lite projects)			
	Committee review of proposed projects; MR2 (no reliability test), M3/NPD (reliability test)			
	Active scope creepage management and approval process			
	Improved capability and process to bring customer cabinets / tests. Enlarge at cabinet test level to show / create value			
	Simple standard and globally adapted process for getting samples to customers and securing evaluation and feedback results			
	Sales after launch (1st year sales) agree with planned/committed, KPI based			
	MIP (Market Introduction Plan) specifying figures for BC, and Samples, Lead customers....			
	AAR – After Action Review of NTD, NPD, NMD, and MR's			

Bridging - closing gaps

Future State Consolidated	Bridging Activity	Target Outcome
Product Competitiveness		
Enhanced speed to market of new products (and more of them)	<ol style="list-style-type: none"> 1. Insure project driven by market needs 2. Prioritize project proposals actively 3. Execute launched (G3) projects uninterrupted 4. Committed resources at G3 5. Narrow program objective from from MIP 6. Technology assessment and operational strategy in ready at G3 	-> Increased market share through higher customer hit rate
Clear management of pipeline 'ideas' before entering the formal proces	<ol style="list-style-type: none"> 1. Make global company product strategy 2. Institute management committes (GCRC, PDC) for project proposals and project execution 3. R1 go/nogo decision based on pre-BC, pre-POD,pre-tech statement 4. Mechanism to establish project proposal priority 5. Make templates for; BD statement, Pre-BC, Tech statement, and Operational Statement 	<ol style="list-style-type: none"> 1.-> Enhanced clarity on criteria for go-no 2 .-> Transparent global management decisions on project proposals and projects in execution 2.-> Project proposals managed by pre-BC value generation 3.-> R1 gate secures sound BC,POD understanding, and tech doability
Early judgement on build vs buy (JV's partnership) and look for opportunities – integrated in BC	<ol style="list-style-type: none"> 1. Global company product strategy to guide ownership level (out/in sourcing) 2. Marketing strategy to guide viabilty, penetration effect 3. Create operation statement for G0/R1 phase, brandlabelling / branding considerations 	<ol style="list-style-type: none"> 1.-> securing discussion early on high level mgt, 2.-> avoiding disturbing ongoing projects 3.-> transparent BC showing options value

Bridging - closing gaps

Future State Consolidated	Bridging Activity	Target Outcome
Organisational Changes		
Clear separation of NPD resources from MR1, CU and quality support activities -> to ensure focus i.e project success	Develop organisational structure; Global resource ownership divided into bold (direct reporting) and stipulated (indirect reporting) – there can only be one resource owner. Develop priority guideline for shared resources	NPD,NMD (MR2,MR3) assigned 80% of the engineering pool. MR1 assigned 20% of the engineering pool.
Resource owners (solid line) become accountable for resource estimation (function area) and NPD timing, sales, cost, product performance	1.Review organisational structure for potential opportunities to better align accountability with resource ownership 2.Improve the clarity between deliverable and gate approval with accountability 3. Develop Project Resource Contract Template	As above
Projects cannot pass G3 without approved resource plan (Global template)		Resource availability and transparency when passing G3, signed by resource owners Avoidance of starting undermanned projects.
All NPD/NMD projects run by professional project managers, out of own global/regional function No more engineer assigned at project leads	Create project management function, enforcing NPD/NMD projects. Project managers to report to head of project management function.	Global independent project portfolio management, global guidelines and standards. Regional project management, full line report to project function, dotted to MD
Strategic marketing capability developed (B.I., Market Intelligence) team can articulate and talk with data	Develop methodology for collecting leading indicator data, related to market trends and potential disruptions	Secure robust understanding of project proposals, for decision making in GCRC
Strengthen S&M with application group responsible to engage customers to identify needs and secure requirement (technical, commercial,application)	Establish application function that supports project proposal phase and project execution phase	Project proposals and projects in execution being driven by market pull, both commercially and technically

Bridging - closing gaps

Future State Consolidated	Bridging Activity	Target Outcome
Communication Roles & Responsibility		
Company becomes market driven, product are pulled by the market	<i>See organisational changes</i>	
Roles and responsibility between the regional MD's and Corporate on NPD / NMD vs. MR1	Make guideline on defining NPD,NMD and MR1, i.e. technically, commercially, and used management process.	Clear split in NPD,NMD and MR1's, with respect to resource assignment, management process and responsibilities
Roles of Sales / Marketing in process with deliverables	Make clear sales and marketing deliverables for NPD, NMD and MR1 development process	Secure robust judgement of sales marketing opportunities in early phases of project proposals and project executions
Systematic collection and reporting on VOC, especially targetting top OEM customers	Establish application function that supports project proposal phase and project execution phase	
Higher level of collaboration and communication (cross region/cross department) to insure projects are properly <i>vetted</i> tracked	Institute; 1. Project management committee's 2. Professional Project Management Function 3. Robust Project Governance Structure (funnel)	1. Clear decisions against strategy and Program Objective 2. Effective execution 3. Clear responsibility and uniformity
Reports (Dashboards) that are online descriptive of actual progress to milestones – todays reports are to qualitative and misleading	Enhance the scorecard in the sense of discipline, and communication	Secure organisation are closely updated on project decisions, and progress.

Bridging - closing gaps

Future State Consolidated	Bridging Activity	Target Outcome
Documentation & Processes		
Market driven business strategy cascaded into operational elements, against which to decide on new project proposals	Refresh business strategy to form basis for project proposals	Robust go/nogo or prioritization decision process on project proposals -> allowing most beneficial projects first
Global standardized process to capture and manage, rank opportunities, for new product sales	Develop guideline to run our committee meetings	
Global standardised (template) forecasting method in business case and for ongoing sales	Develop MIP template for securing the projected sales for execution projects	Supporting go/nogo or prioritization decision process on project proposals
Standardized pre-business case for NPD and NMD project proposals. Securing robust validation of sales figures and timing constraints	Decide on pre-BC template,	Supporting go/nogo or prioritization decision process on project proposals
Standardized business case for NPD and NMD project execution securing pre-business case take-over and updating + CER	Above pre-business case extracted from present business case including NMD	Supporting go/nogo or prioritization decision process on project proposals
Concurrent global cross functional (Sales,S/C,R&D) standardized NPD/NMD processes with clearly defined gates, and approval process of cornerstone documents	Upgrade NPD2 process description, develop guideline for usage	High uniform quality of passing gates, securing deep anchoring in organisation
NPD deliverables to be consolidated into fewer and higher quality documents	Upgrade NPD2 process description, develop guideline for usage	High uniform quality of passing gates, securing deep anchoring in organisation

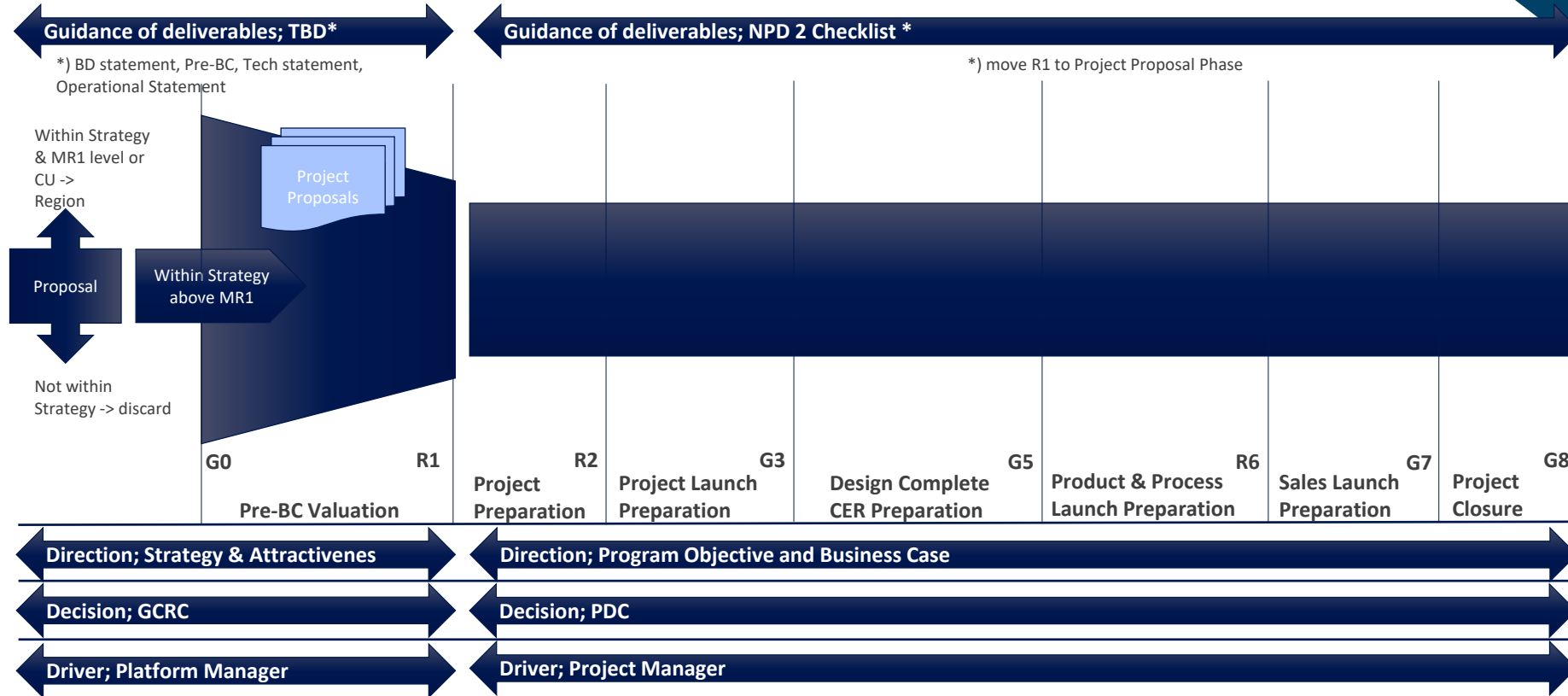
Bridging - closing gaps

Future State Consolidated	Bridging Activity	Target Outcome
Documentation & Processes		
Clear definition how to categorize and manage NPD, NMD and MR projects. (NMD process that is visible and tracked like NPD lite projects)	Upgrade NPD2 process description, develop guideline for usage. Make guideline on defining NPD,NMD and MR1, i.e. technically, commercially, and used management process.	
Committee review of proposed projects; MR2 (no reliability test), M3/NPD (reliability test)	<i>See instituting previous slide + above guideline</i>	
Active scope creepage management and approval process	Develop guideline for handling scope creepage	Project manager can either; 1.allow scope creepage (due to low risk) 2. Send scope creepage proposal back to G3 review of project (strong independent PM needed)
Improved capability and process to bring customer cabinets / tests. Enlarge at cabinet test level to show / create value	Create stronger application function.	
Simple standard and globally adapted process for getting samples to customers and securing evaluation and feedback results	Market Introduction Plan (MIP) to specify sample planning, including agreed test and feedback process	To support development team in understanding product functioning and complying against PO
Sales ramp-up/market penetration follows plans	Market Introduction Plan (MIP) to specify key customers with which agreements exists on product ramp-up (i.e. AHT, Embera, True) KPI driven on sales and timing (G3) measured at	Maintain BC value as stated at G3

Bridging - Mapping Project Governance Process

Enhance clarity and R&R

- 1. More contact to OEM customers
- 2. More discipline to funnel management

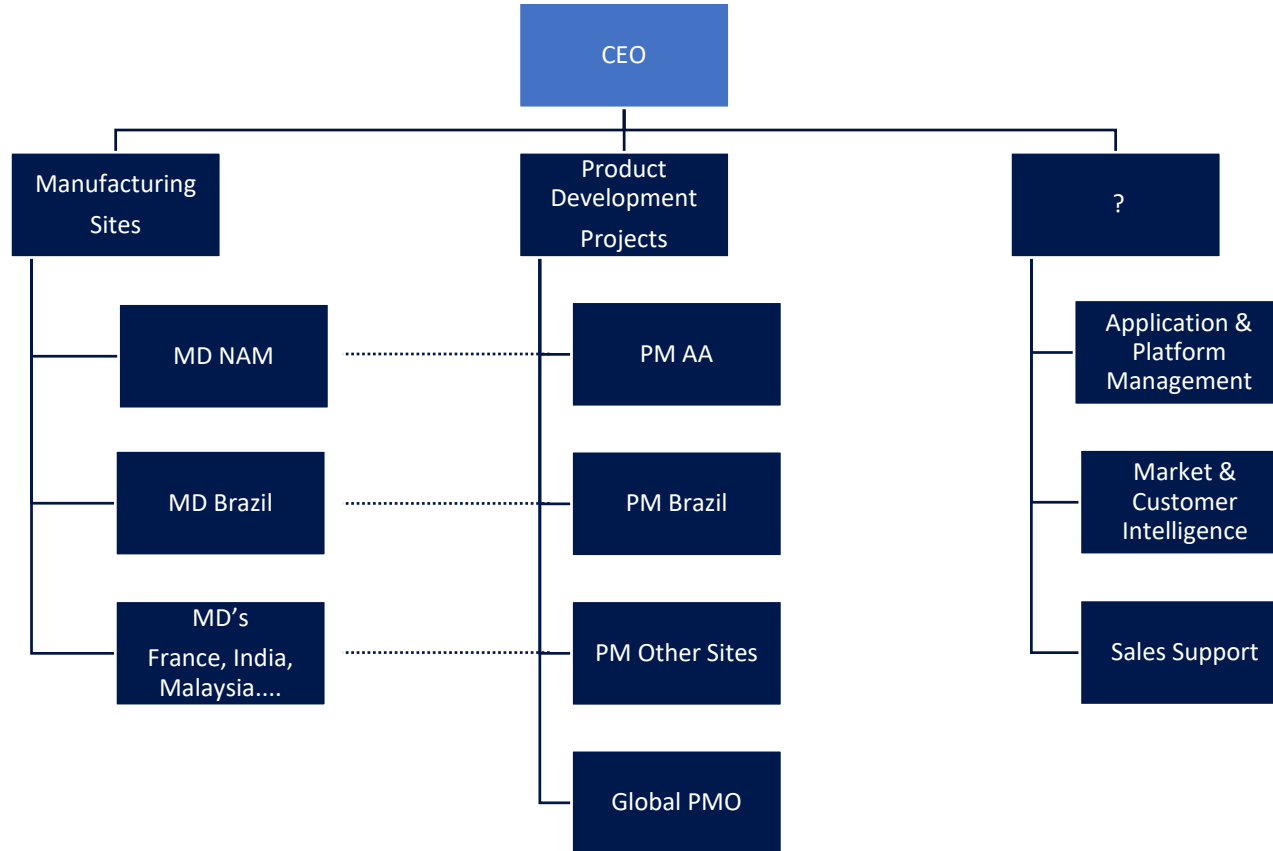


GCRC; Global Compressor Roadmap Council (Chairman; Head of Sales)
 PDC; Project Development Committee (Chairman; Head of PDP)

Bridging -

Mapping Organizational Changes

Market Driven Focus and strong Project Leadership



Market Driven Focus;

Project Proposals Phase

- Drive Project Proposals to R1
- Report to GCRC
- Expert Market Understanding

Execution Projects Phase

- Enforce Technical Expertize
- PO responsibility
- MIP responsibility
- Sales figures
- Direct contact to top customers

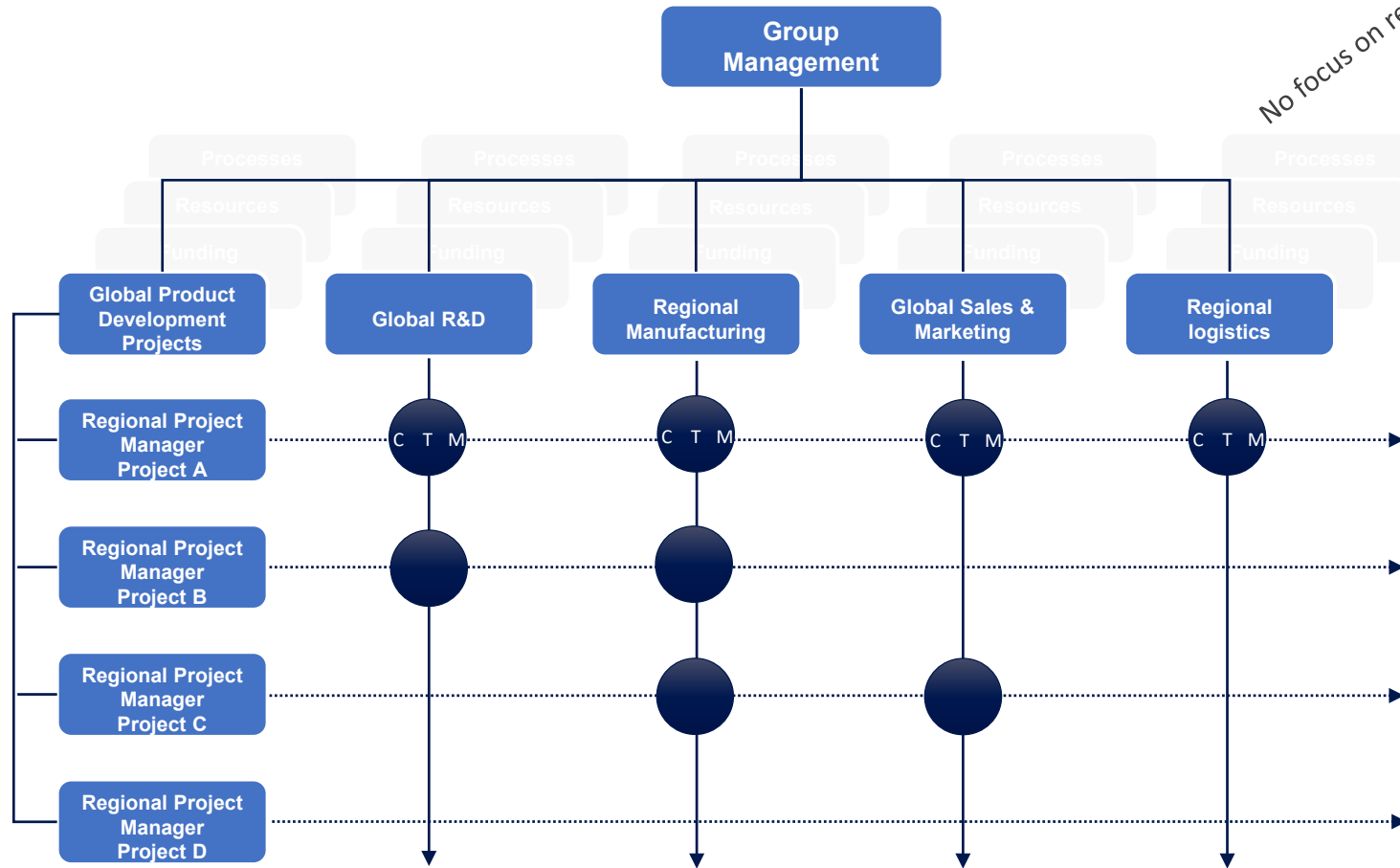
Strong Project Leadership;

- PM located in Regions
- Drive Projects after R1 passed
- Report to PDC
- Report to Head of PDP, dotted to MD
- PM profile 'mini CEO'
- Core-Team-Members reports to function, dotted to PM

Bridging -

Mapping Project Management Principles

Enhance clarity and R&R



- Main principles;
- Function R&R**
- Project funding's comes from Function Area (budget process)
 - Project resources is assigned by Function Area (resource mgt)
 - Projects uses Function Area processes
- Project R&R**
- PM manages project according to BC and PO. Reports to head of Global PDP
 - CTM (Core-Team-Member) manages Function Area resources according to project demands and tasks. Reports to Function Area
 - Team members reports to CTM

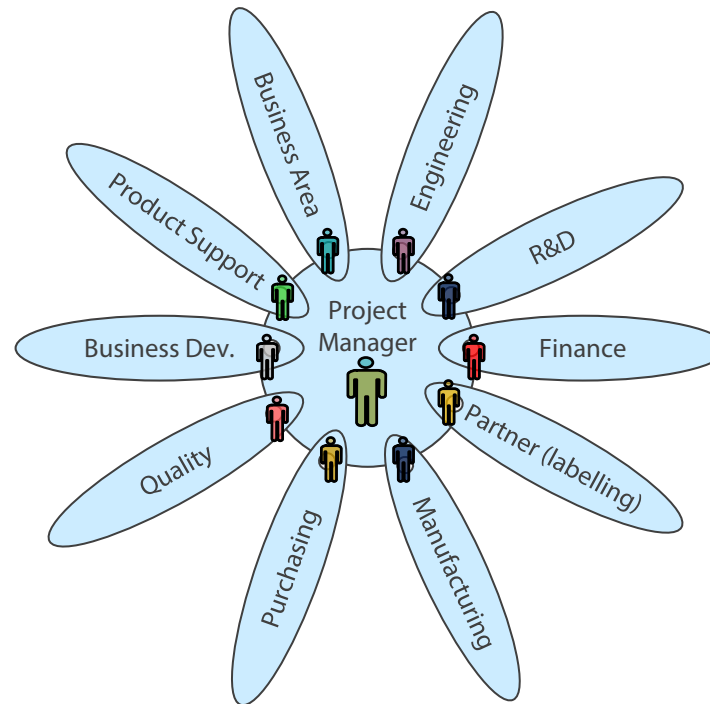
Bridging -

Mapping Project Management Processes

Enhance clarity and R&R

Core Team member R&R

- Represents the Functional Area and draws on the expertise from there
- Responsible for contributing to Project target setting and accomplishment of targets
- Makes decisions and commitment, on behalf of the Function Area, in the project team
- Shares Projects goals, informations and progress in own Function Area and
- Leads and delegates the project activities running in own Function Area
- Ensures that the Function Management pre-milestone is held, concluded, and signed min 2 weeks ahead of the PDC meeting, and conclusion shared with the project manager



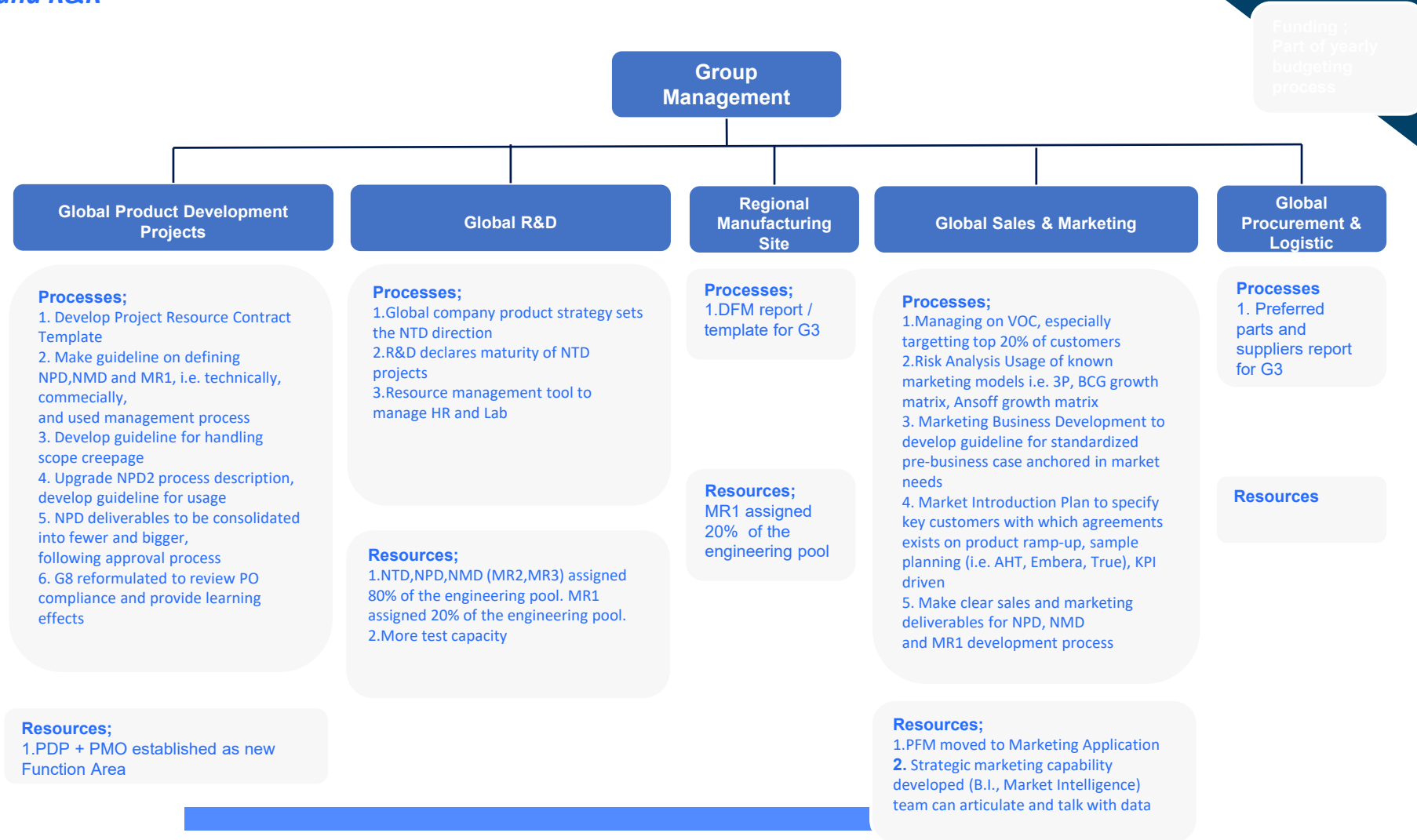
Project Manager R&R

- The Projects 'Mini CEO'
- Full business case responsibility for the project and is accountable towards the PDC
- Act as the advocate of the whole team (all line functions relevant for the project)
- Leads and motivates the complete project team
- Manage time, cost, specifications and quality, according to Business case
- Secure that the Project Gate report is available 1 week ahead of the PDC meeting
- Request CTM to perform pre-milestone meeting 2 weeks before PDC meeting

Bridging -

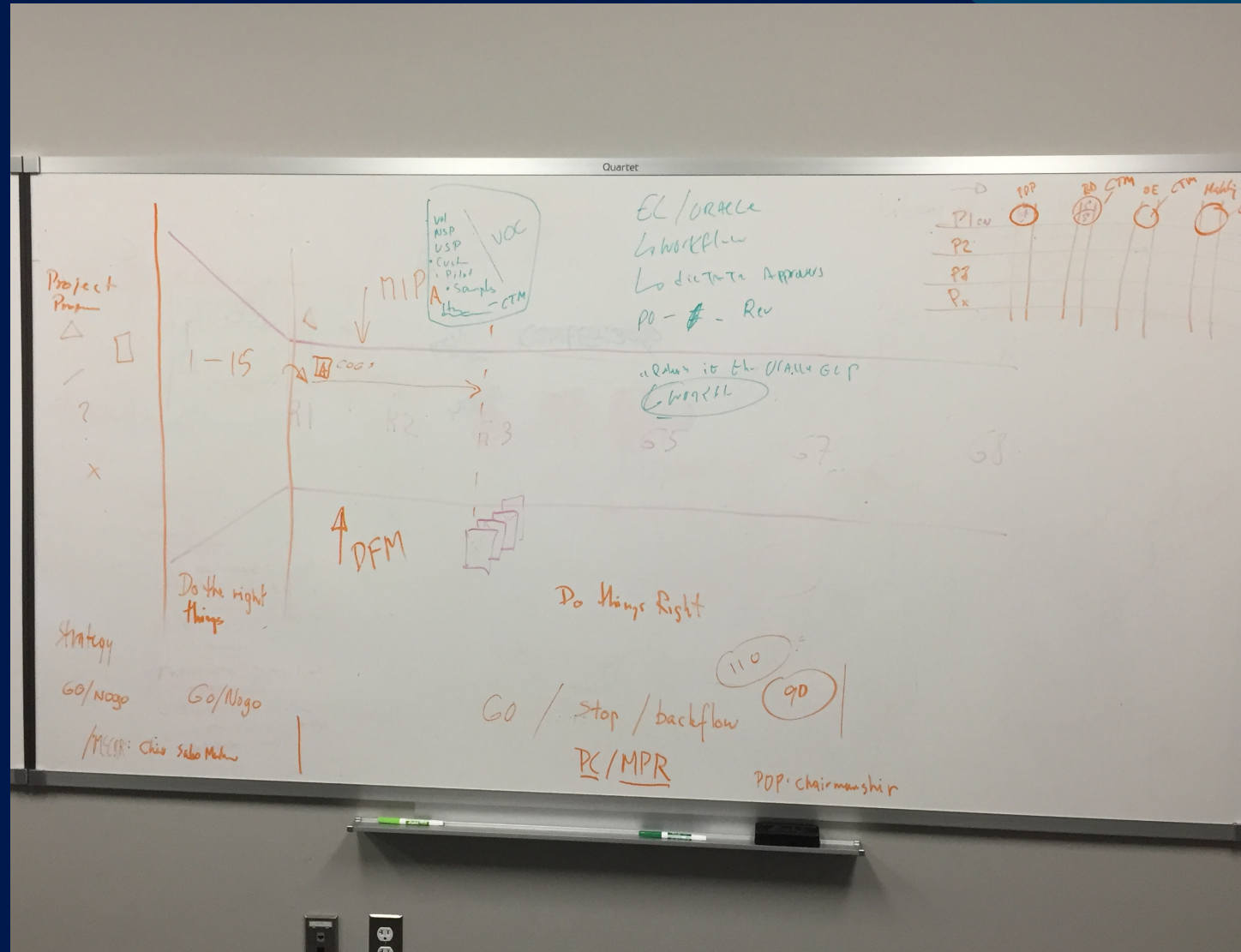
Mapping Function Standardization Processes

Enhance clarity and R&R



Back-up

- Project Governance Flow Channel.
- Project Matrix Structure.



Back-up

Project

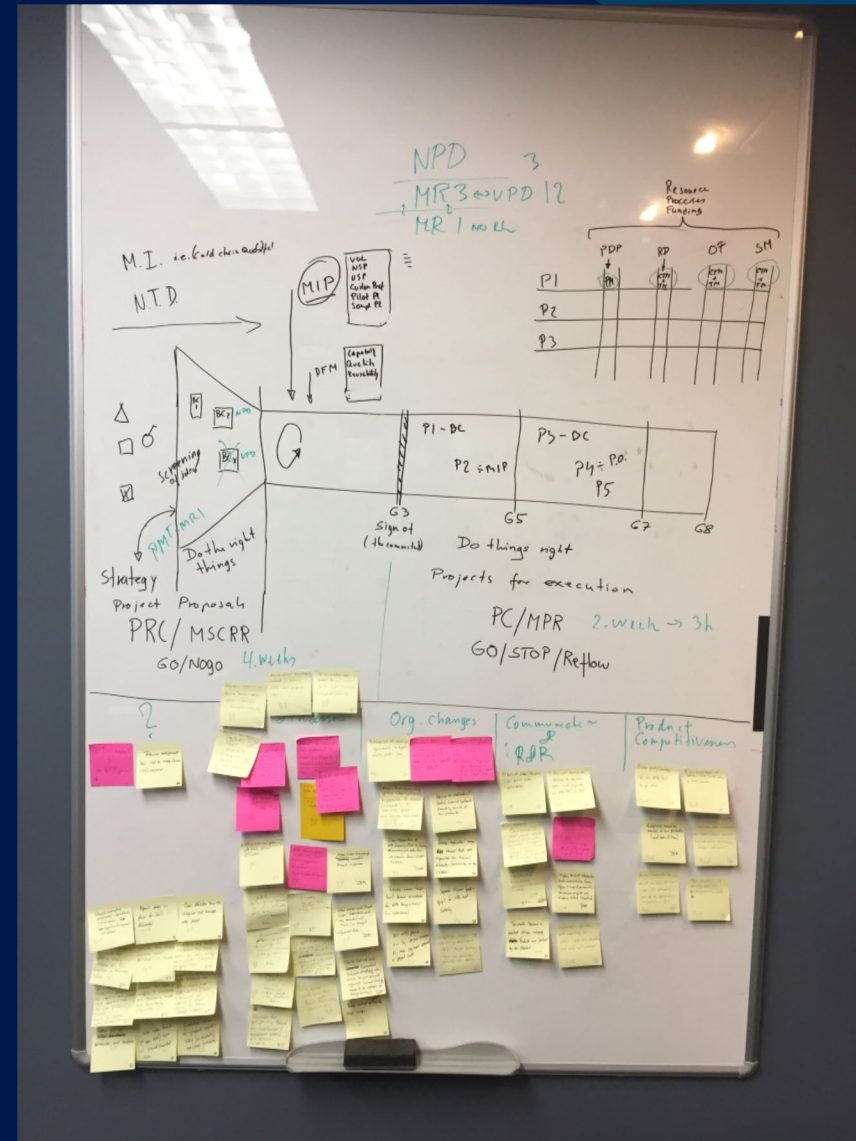
Governance

Flow Channel.

Future State issues on post-it.

Categories (from left to right);

- ?
- Doc & Processes (note block of post-it below '?' belongs also to this category)
- Org. Changes
- Communication and Roles & Responsibilities
- Product Competitiveness



Back-up

Type of Impact Synthesis

FR

	AJ 2	TA 2	AK 2	AW 2	AG Stretch	TOTAL
Technical Issue on Product	2	8, 2		8, 6	2.5	28.5
Insufficient Supplier Expertise	3	4	4, 4			15
Resources Allocation					2.5, 10	12.5
Product Testing			3.5	3		6.5
Technical Issue on Process				4	1	5
Project Scope				3	1	4
CER			3.5			3.5
Union & Representative Body	3					3
		In months of delays				



Thank You.



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<https://michelsen-project-consulting.com>