VTMM - Virtual Team Maturity Model

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1. VTMM - Virtual Team Maturity Model

Based on the observations during the control group experiments and the literature review, a maturity model seems to be the best way to improve the performance of a virtual software development project team.

VTMM is built basically on the basis of three theories:

1. The Tuckman model of team phases
2. Theme Centric Interaction by Ruth Cohn
3. John Gottman research on relationships

The Tuckman model of Forming, Storming, Norming, Performing and Adjourning has been chosen as this cycle is well well-accepted in literature and in practical application. It can be assumed that members of a virtual team will go through this phases as well.

Alternatives would have been behavioural methods like TMS - Team Management System or Belbin Team Inventory. All behavioural methods are based on the learned behaviour of the team members. The processing of information in virtuality is different. Also these models have the disadvantage that they are not process-based.

Theme Centric Interaction has been chosen as it can be well-adapted to the virtual work environment. It describes well the relationship between the task, the individual and the team. TCI is an accepted reference for team development and team leadership.

Gottmans research of relationships has been chosen as it includes the emotional part of the relationship and the resulting satisfaction of the members of the relationship.

1.1. Development of VTMM

The initial research started with two control group experiments of virtual team performance. At this time, it was assumed that virtual team performance is based on the skilful use of virtual team tools such as SeondLife. The two experiments showed something else. Tools are less important than the processes to bring virtual teams to higher performance. This observation is confirmed by the findings of Nemiro. Based on the literature review, it was found that there is no process-based maturity model for virtual teams. Then VTMM was defined based on the *PMBOK*® Guide, EFQM and CMMi and the related research.

After the definition an evaluation of the model took place with 11 teams from different industries. There the difficulties of virtual teamwork on the workplace became evident. Team members and also team leaders had to start virtual teamwork without any formal training on virtual teamwork. In some cases, even an introduction to the virtual collaboration platform was missing.

As a result of the evaluation, two VTMM processes were added: The goals process and the task management process. Both processes are important for the performance of virtual teamwork. A virtual team needs clear and committed goals. Also the task assignment and monitoring process needs to be transparent.

Also the Lessons Learned library was added to allow learning across teams.

1.2. Scope of the model

The model is designed to do the following:

1. To assess the maturity of a virtual team. The maturity will be assessed for each domain of the model.
2. To guide a specific virtual team to higher performance. Here the model will propose some logical steps to improve the performance of the virtual team quickly.
3. To benchmark the virtual team performance against industry-best-practice. This will be possible after a critical number of assessments have been done and industry-trends can be calculated.

1.3. Out of scope of the model

The limits of the model are:

- To assess the maturity of an organisation in virtual teamwork. The model is designed only to assess one particular virtual team. Organisational aspects are excluded from the maturity assessment. Such organisational aspects could be the availability of particular training curricula for virtual team members or leaders of virtual teams or the standardisation of tools across departments or countries.

1.4. Core Model

The core model has four domains. A domain is a collection of related knowledge.

The four domains of the model are:

1. <u>Processes</u>. Here are the team processes describe to compensate the missing face-to-face interactions.
2. <u>Tools</u>. Here are the virtual team tools described to support the other two domains
3. <u>Culture</u>. Here are elements described which have an impact on the way the team collaborates.
4. <u>Lessons Learned</u>. Here experiences from virtual teamwork are captured and made available for other teams.

1.4.1.   Levels

Level 0: Undefined
Incomplete is defined as some elements in one or more domains are implemented and can be measured. This level is the undefined level of team maturity. Virtual teams on this level can be successful. However the success is based on individual strengths and charisma.

Many of the processes, tools or cultural elements are missing and most likely also unknown to the virtual team members, leaders and sponsors. Therefore the virtual team does not know what to do to improve the performance of the virtual team.

Objective for performance improvement
Educate the team on virtual team processes, virtual team tools and cultural elements so that the team develops awareness on what are the possibilities to get to a higher virtual team performance.

Level 1: Basic
At this level the team has awareness on what is required to increase the performance of the virtual team. All the quick wins have been implemented and the team performance increased, productivity increased, the level of conflict decreased and the team members develop trust and deepen their relationships.

Objective for performance improvement
After the quick wins have been implemented it is now important to create a solid structure which allows the team to increase its performance further. There will be still some learning taking place on implementing new processes, tools and cultural elements.

Level 2: Advanced

At this level, all elements of the VTMM are present. The virtual team has a positive culture, the different tools are used for different tasks and the virtual team processes are fully implemented or the decisions not implementing them have been well documented. The level of conflict is low and the performance is high. The team invests time into the relationship with other team members. Complex tasks are managed successfully and issues are tabled early and dealt with efficiently.

Objective for performance improvement

The team has a good performance to complete the project successfully. Now, the structure has to be implemented in such a way that the team performance will maintain this level of performance even if there are changes in the team (members leaving or entering the team).

Level 3: Mastery

All elements are present to the needed levels. The team is in a state of „flow" and the performance is very high. The team has implemented knowledge management processes and works on the optimisation of the virtual team processes, the tools and its culture. Team members are enjoying being on the team and the project progresses according to schedule, budget and scope, including the right quality.

Objective for performance improvement

The objective is now maintaining this level over time or until the end of the project.

2. Domain Processes

The processes are described in terms of inputs, methods and outputs. The processes identified for virtual teamwork are designed to overcome distance and isolation. The processes and their objectives are:

1. *Get-to-know-each-other*. This process provides a standard orientation for new team members. It supports the creation of a team identity.
2. *Rules*. This process provides the agreement for the virtual collaboration. It provides an orientation for new team members and serves as a arbitrary document in case the team gets into a conflict. It also allows the team members to operate within clearly defined boundaries.
3. *Goals*. Virtual teams need a common purpose to develop the energy and motivation working together. Having clear goals is therefore essential to get the team development started.
4. *Task Management*.This process distributes and monitors the tasks to be done of the virtual team.
5. *Feedback*. In a virtual team and due to its high degree of non-verbal communication, regular formal feedback is necessary for the leader and team members to develop a sense of where the team is and preventing conflict early enough. The feedback process is the early warning system.
6. *Decision-Making*. In a virtual team the decision-making has to be transparent. Therefore, formal decision-making is necessary so that all team members can follow the reasons for the decisions and the related majorities.
7. *Meeting Management*. Virtual team meetings have a significant impact on the motivation of the virtual team. Virtual team meetings have to be prepared, executed and followed-up correctly to keep the motivation up in the virtual team. A special meeting is the virtual kick-off meeting.
8. *Socialising*. This process compensates for the missing face-to-face interaction such as coffee breaks during meetings or meeting in the kitchen where important communications take place.
9. *Information Management*. The management of information is important to keep a clear understanding about the task, the decisions, the action items and the versioning of the documents.
10. *Reward & Recognition*. This process appraises positive behaviour and discourages undesired behaviour. It is important to support the team culture.
11. *Ramping-Down*. This process manages the how the virtual team is dissolved.

The processes have the following inputs, methods and outputs:

2.1. Get-to-know-each-other-process

This process provides a standard orientation for new team members. It supports the creation of a team identity.

Inputs	Methods	Outputs
Team members local environment Cultural Orientations Personal Experience Media Competence	Personal introductions Expert knowledge	Initial Team Culture

Inputs
- *Team member local environment* is defined as the country where the team member lives in. It includes local food, regulations, traditions, religious holidays, working environment etc.
- *Cultural Orientations* is defined as an inclination to think, feel or act in a way that is culturally determined. It affects areas of power and responsibility, time management, identity and purpose of life, organizational arrangements, communication patterns and so on. It is based on the *Cultural Orientations Framework (COF)* by Philippe Rosinski described in his book *Coaching Across Cultures* (2003).
- *Personal experience and position* is defined as the professional background and work experience as well as each team members function within the team and/or organisation.
- *Media competence* is the ability to use the collaboration tools in an efficient manner to communicate successfully in virtual communication interactions.

Methods
- *Personal introductions* are defined as the number of information team members are willing to share with each other.
- *Expert knowledge* is defined as the knowledge of the team leader and the team members about this process.

Outputs
- *Initial team culture* defines the emergent culture of this particular team. It can be positive or negative based on the results of the get-to-know-each-other process.

2.1.1. Key Performance Indicators (KPI's)

Level	KPI
1 Basic	- Team members have pictures from each other, as profile picture - Team members seldom chat with each other; sharing private information to learn more about each other
2 Advanced	- Team members have pictures of each other, as profile picture - Team members sometimes chat with each other; sharing private information to learn more about each other - Team members know a bit about the family situation of the other team members - Team members know much about the family situation of the other team members
3 Mastery	- All team members maintain their social media profiles and connect to each other - All team members use the same platform and share information outside work - Team members celebrate their birthdays informally - Team members frequently chat about everything with each other; sharing private information using individual and team chats - Team members know details about the family situation of the other team members

2.2. Rules-process

The process of rules provides the agreement for the virtual collaboration. It offers an orientation for new team members and serves as an arbitrary document in case the team gets into a conflict. It also allows the team members to operate within clearly defined boundaries.

Inputs	*Methods*	*Outputs*
Team members local environment Individual learning styles Cultural Orientations	Collaboration meeting Signing process	Team charter Leadership charter Team constitution

Inputs
- *Team member local environment* is defined as the country where the team member lives in. It includes local food, regulations, traditions, religious holidays, working environment etc.
- *Individual learning styles* is defined as the learning style of the team member.
  This considers the different pattern of acquiring and processing information (visual, auditory, kinaesthetic) leading to individual ability to adapt to changes and learn new techniques.
- *Cultural Orientations* is defined as an inclination to think, feel or act in a way that is culturally determined. It affects areas of power and responsibility, time management, identity and purpose of life, organizational arrangements, communication patterns and so on. It is based on the *Cultural Orientations Framework (COF)* by Philippe Rosinski described in his book *Coaching Across Cultures* (2003).

Methods
- *Collaboration meeting* is a virtual meeting where the team members discuss how they want to work together. This meeting can be repeated through-out the project as a new project phase requires new rules of collaboration. As a first step the team charter should be discussed, then the leadership and finally the team constitution, stating what is important in the team and what is the spirit of collaboration.
- *Signing process* is a ritual where the team members commit to the team charter, leadership charter and team constitution.

Outputs

- *Team charter* is defined as the document which defines the social aspects of the team. It illustrates the team's focus and directions while establishing boundaries. Do's and Don'ts of the team members working together.
- *Leadership charter* defines the leadership aspects of the team. What is the leader allowed to do, where do the leader need to involve the team and how does the leader organise his leadership.
- *Team constitution* is a formal document describing how the team wants to work together, what are the rights and responsibilities of each team member and how governance is defined on the team. How is the leadership selected and replaced? How does the team change its own policies, including this constitution?

2.2.1.   Key Performance Indicators (KPI's)

Level	KPI
1 Basic	- We have an informal team charter - We have an informal team constitution
2 Advanced	- We have a formal team charter in defined template - We have an informal leadership charter - We have a formal team constitution in defined template
3 Mastery	- We have a formal team charter in defined template with archiving process - We have a formal leadership charter in defined template with archiving process - We have a formal team constitution in defined template with archiving process

2.3. Goals-process

Virtual teams need a common purpose to develop the energy and motivation working together. Having clear goals is therefore essential to get the team development started.

Inputs	*Methods*	*Outputs*
Team briefing	Decomposition	
Task briefing	Creative techniques	Agreed team goals
Task descriptions	Commitment rituals	Committed team members
Project briefing	Expert judgement	

Inputs
- *Team briefing* is a document describing who is on the team and what are the competencies of the team members.
- *Task briefing* is a document describing the tasks to be achieved by the team on a high-level
- *Task descriptions* is a document describing the tasks of the team on a detailed level
- *Project briefings* is a document describing the project on a high-level. A project charter can be used for this purpose as an example.

Methods
- *Decomposition* is the process of transforming the team, task and project briefings and the task descriptions into a goal hierarchy. It is recommended to have goals in different domains, e.g. technical and social goals.
- *Creative techniques* are used to write clear goals and also a set of complete goals for the team and the task.
- *Commitment rituals* these are repeated small processes to create the momentum within the team to work towards the goals and to accept and integrate the goals fully.
- *Expert judgement* is used to develop meaningful, SMART (specific, measurable, agreed/ambitious, realistic and time-bound) goals.

Outputs
- *Agreed team goals* are committed and empowered by the energy of the team.
- *Committed team members* are motivated to accept and achieve the goals.

2.3.1. Key Performance Indicators (KPI's)

Level	KPI
1 Basic	- Some team goals are defined informally
2 Advanced	- Some team goals are defined formally, agreed and committed by team members - Some personal goals supporting the team goals are agreed and committed formally
3 Mastery	- All team goals are defined formally, agreed and committed by team members - All personal goals supporting the team goals are agreed and committed formally - All team and personal goals are monitored and optimized formally in a peer process

2.4. Task Management

This process distributes and monitors the tasks to be done of the virtual team.

Inputs	Methods	Outputs
Scope of Work OPA Work History Resource Information Task Schedule Knowledge Requirements	Expert knowledge Elicitation techniques Decomposition Specific Meetings Inspections	Task list Work Schedule Progress Report

Inputs

- *Scope of Work* includes documents that provide information about the work boundary, work elements, assumptions and constraints on them and relations between them. The work scope information can come from the contract, business case, requirement documents, Policies and Procedures, etc.
- *OPA* (Organisational Process Assets) is defined as all standards and templates that the virtual team collected and defined previously. Some pieces of the information may be defined by the clients as a part of the contract.
- *Work History* is defined as any information that is related to previous work experience of virtual team as a group or individually.
- *Resource Information* is defined as materials, services, staff, or other assets that are transformed to produce benefit and in the process may be consumed or made unavailable.
- *Task Schedule* is defined as a schedule with listed responsibilities, accountabilities and milestones.
- *Knowledge Requirements* - the explicit or tacit requirements on the knowledge of a team member or several team members which they need to have or acquire before they can start the task successfully.

Methods

- *Expert Knowledge* is defined as the knowledge of the team leader and the team members about this process.
- *Elicitation Techniques* is defines as all techniques that are possible to use by the virtual team to collect information about the work scope (e.g. observation, questionnaires, prototypes,…)
- *Decomposition* is defined as a technique to break down a task to sub-tasks and task parameters. In formal work/project, it is a useful technique to create WBS (work breakdown structure) and to identify phases, deliverables and work packages.
- *Specific Meetings* include all types of meeting that is possible to hold by a virtual team to figure out about the work scope, the work task, etc. It handles through the Meeting Management process.
- *Inspection* is defined as techniques/process to control and monitor the quality of executed tasks and the tasks progress.

Outputs

- *Task List* is defined as a list of all task parameters that a virtual team needs to work on to provide suitable results. It can be presented by WBS or a simple spread sheet.
- *Work Schedule* is defined as a document that includes task list, dependencies between tasks, assigned resources, task duration, etc.
- *Progress Report* is defined as a document that monitors the progress of the project.

2.4.1. Key Performance Indicators (KPI's)

Level	KPI
1 Basic	- We distribute tasks within the team and follow-up on them occasionally - We use standard office tools to manage tasks, e.g. Outlook, Excel. - We use a standard office tool to manage work status reports.
2 Advanced	- We have a process defined. All tasks are recorded, assigned and followed-up in a structured manner. - We use one collaborative tool for task management so that everybody is on the same page. - We use one format and one tool for the work status reports. The report generation is done manually. - We have an agreed format for our tasks defined and the fields are enforced. - We have a proactive task control process in our team defined. This process gives advanced notices to tasks owners. - We estimate on all tasks the effort estimates.
3 Mastery	- We have a process defined. All tasks are recorded, assigned and followed-up in a structured manner. We continuously seek to improve the process and reduce its complexity. - We use an integrative tool to combine task management with other team processes such as meeting management - We use one tool which automatically generates work status reports. The reports are generated automatically - We have an agreed format for our tasks defined and this format is supported by our task management tool. - We have an automated system for task control in our team and the team members complete tasks on or ahead of time. - We estimate and, if necessary correct the effort estimates following a defined process, on all tasks.

2.5. Feedback

In a virtual team and due to its high degree of non-verbal communication, regular formal feedback is necessary for the leader and team members to develop a sense of where the team is and preventing conflict early enough. The feedback process is the early warning system.

Inputs	Methods	Outputs
Motivational measurements Written comments Verbal comments Cultural orientations	Feedback meeting Written Feedback Surveys	Improved Team Performance Resolved conflicts Increased personal satisfaction

Inputs
- *Motivational measurements* are recorded data on the motivation of the team members. An example of such a measurement application is Motivatoring, developed by the University of Delft. Repeatedly the motivation is measured by self-assessment and splayed in a personal data file.
- *Written comments* express observations of the different team members. They are submitted to the responsible person prior to the feedback meeting.
- *Verbal comments* express observations of the different team members. They are captured during meetings between feedback meetings or made as an input in the beginning of the meeting.
- *Cultural orientations* is defined as an inclination to think, feel or act in a way that is culturally determined. It affects areas of power and responsibility, time management, identity and purpose of life, organizational arrangements, communication patterns and so on. It is based on the *Cultural Orientations Framework (COF)* by Philippe Rosinski described in his book *Coaching Across Cultures* (2003).

Methods
- *Feedback meetings* are formally structured meetings to give and receive feedback. They have to follow a ritual so that nobody in team feels hurt and everybody can learn from it.
- A *Written Feedback* survey is a set survey where comments on different tasks are collected. When the same survey is repeated over time, changes and progress can be monitored.

Outputs
- *Improved team performance* is defined as higher motivation of the team members and better work results such as higher quality, compliance with schedule and lower costs.
- *Resolved conflicts* are defined as mediated and accepted solutions to different opinions or attitudes of the team members.
- *Increased personal satisfaction* is defined as a more comfortable feeling of the team members in the team and a sense of purpose of the team members.

2.5.1. Key Performance Indicators (KPI's)

Level	KPI
1 Basic	- Sometimes feedback polls are taken at the end of virtual meetings
2 Advanced	- Periodically feedback polls are taken at the end of virtual meetings. - Periodically records on numbers of formal team feedback sessions are taken.
3 Mastery	- Always feedback polls are taken at the end of virtual meetings. - Always records on numbers of formal team feedback sessions are taken.

2.6. Decision-making

In a virtual team the decision-making has to be transparent. Therefore, formal decision-making is necessary so that all team members can follow the reasons for the decisions and the related majorities.

Inputs	Methods	Outputs
Open decisions Decision-making rules Cultural orientations	Decision-making meeting	Team decisions Postponed decisions Escalated Decisions

Inputs
- *Open decisions* are defined as decisions and/or choices which have to be made. Postponed decisions are reversed to the status of open decisions for the next meeting.
- *Decision-making rules* are defined as rules for making decisions as stated in the leadership charter.
- *Cultural orientations* is defined as an inclination to think, feel or act in a way that is culturally determined. It affects areas of power and responsibility, time management, identity and purpose of life, organizational arrangements, communication patterns and so on. It is based on the *Cultural Orientations Framework (COF)* by Philippe Rosinski described in his book *Coaching Across Cultures* (2003).

Methods
- *Decision-making meetings* are formally structured meetings to make decisions. The outcome can be:
  o Decision made. The outcome can be anything between yes and no including implementation steps for the decision.
  o Decision postponed. If the team cannot make a decision, then the decision can be postponed, including a date by when the decision has been made finally and also which facts need to be investigated to be able to make a decision.
  o Decision escalated. If the scope of a decision exceed the team's responsibilities, the task is reported to other instances to be decided there.

Outputs
- *Team decisions* are defined as documented decisions from a meeting.
- *Postponed decisions* are defined as decisions to be made later with more information available.
- *Escalated decisions* are subjects that exceed the team's responsibilities and are reported to other instances to be decided.

2.6.1.   Key Performance Indicators (KPI's)

Level	KPI
1 Basic	- We do not have a decision making process - We sometimes record our decision - Not all team members have to participate formally in the decision-making through poll
2 Advanced	- We have an informal decision making process - Every team member can ask for a decision on any topic, but needs to be approved by team - Decisions are implemented as documented via email - Sometimes decisions are taken within a defined time
3 Mastery	- We have a formal decision making process - We record our decision formally - Every team member can ask for a decision on any topic - Often decisions are taken within a defined time - All team members have to participate formally in the decision-making through poll - Decisions are implemented as documented formally in a defined template

2.7. Meeting management

Virtual team meetings have a significant impact on the motivation of the virtual team. Virtual team meetings have to be prepared, executed and followed-up correctly to keep the motivation up in the virtual team. A special meeting is the virtual kick-off meeting.

Inputs	Methods	Outputs
Agenda and invitations Minutes of previous meetings Meeting rules Cultural orientations Media Competence	Virtual collaboration tools Specific Meetings	Meeting minutes Update of Related Documents

Inputs
- *Agenda and invitations* includes written documentation which is made available to the team members before the meeting.
- *Minutes of previous meetings* includes written documentation which is made available to the team members before the meeting.
- *Meeting rules* is defined as the rules of conduct as stated in the team charter.
- *Cultural orientations* is defined as an inclination to think, feel or act in a way that is culturally determined. It affects areas of power and responsibility, time management, identity and purpose of life, organizational arrangements, communication patterns and so on. It is based on the *Cultural Orientations Framework (COF)* by Philippe Rosinski described in his book *Coaching Across Cultures* (2003).
- *Media competence* is the ability to use the collaboration tools in an efficient manner to communicate successfully in virtual communication interactions.

Methods
- *Virtual collaboration tools* is defined as all the different tools available to the virtual to conduct the meeting.
- *Meetings* can have one or different purposes. Common meeting purposes are issue meetings, status meetings or problem-solving meetings.

Outputs

- *Meeting minutes* is defined as a results protocol of the meeting. It includes action items, decisions and comments
- *Update of related documents* is defined as a formal recording of the meeting's decisions, adjustments to documents of Task and Decision Management, made available to all team members.

2.7.1. Key Performance Indicators (KPI's)

Level	KPI
1 Basic	- We create an informal agenda at the beginning of the meeting - We have informal minutes - We have informal lead times - Team thinks about who can contribute and invites people - We have an informal time limitation - We have an informal process
2 Advanced	- We create a formal agenda when we plan the meeting - We have formal minutes - Team invites people and asks feedback from participants - We have a formal time limitation
3 Mastery	- We create formal agenda when we plan the meeting and get approve before meetings - We have formal minutes with approval process - We have formal lead times with approval process - We have formal lag times with approval process - Team invites people and ask feedback from participants for improvement of process - We continuously work on reducing the time limit - We have a formal process - We have a formal process and work on its improvement

2.8. Socialising

This process compensates for the missing face-to-face interaction such as coffee breaks during meetings or meeting in the kitchen where important communications take place.

Inputs	Methods	Outputs
Personal Information

Personal Curiosity

Informal Communication Skills

Cultural Orientations

Media Competence | Social media and networks

Virtual Teambuilding | Improved team performance

Higher Team Maturity |

Inputs

- *Personal information* is defined as information known to the individual.
- *Personal curiosity* is defined as the attitude and mindset to learn more from other team members
- *Informal communication skills* is defined as the ability to make contact and do small talk in a virtual environment and exchange consent, consideration and information informally.
- *Cultural orientations* is defined as an inclination to think, feel or act in a way that is culturally determined. It affects areas of power and responsibility, time management, identity and purpose of life, organizational arrangements, communication patterns and so on. It is based on the *Cultural Orientations Framework (COF)* by Philippe Rosinski described in his book *Coaching Across Cultures* (2003).
- *Media competence* is the ability to use the collaboration tools in an efficient manner to communicate successfully in virtual communication interactions.

Methods

- *Social media and networks* can include large public social media networks (such as Facebook, LinkedIn, XING, Yammer and others or company-specific who-is-who installations). Apart from its motivational effect, this informal and interdisciplinary exchange helps in making expertise visible, setting up and maintaining low cost "weak ties" networks and making opportunities to collaborate more closely visible.

- *Virtual teambuilding* defined as team building tasks offered through exercises or collaborative games (such as distributed brain gymnastics, coaching games,…) or virtual simulation tools, where people communicate through avatars (such as second life, S-cube,…) used for reflective learning and change of perspective.

Outputs
- *Improved team performance* is defined as higher motivation of the team members and better work results such as higher quality, compliance with schedule and lower costs.
- *Higher team maturity* defined as earlier and more complete transition into performing state, resulting in higher innovativeness and ability to react to problems, and much lower administrative effort to steer tasks and communication.

2.8.1. Key Performance Indicators (KPI's)

Level	KPI
1 Basic	- We once recorded how the variety of social activities matched the team culture
2 Advanced	- Sometimes we keep records on regular social activities, that are repetitive in nature and style. - We sometimes record how the variety of social activities match the team culture.
3 Mastery	- We always keep records on regular, repetitive social activities. - We always record how the diversity of social activities match the team culture.

2.9. Information management

The management of information is important to keep a clear understanding about the task, the decisions, the action items and the versioning of the documents.

Inputs	Methods	Outputs
Documents Rules of document management	File management systems Document management systems Virtual team information system	Structured information Maintained documents Improved Team Performance

Inputs
- *Documents* is defined as any generated piece of information available in electronic media
- *Rules of document management* is defined as how the team will manage the information. This can be naming conventions, storage locations, work flows, distributions rules, also as defined in the team charter.

Methods
- *File management systems* is defined as the system which distributed files and links to documents (such as Share Point, Project Wiki, Librarian Role, Taxonomy…).
- *Document management systems* is defined as database-supported management of the documents (including storage, versioning, metadata, security, as well as indexing and retrieval capabilities).
- *Virtual team information system* can be any information system supporting the management of information, collaboration and creativity of the team (such as collaboration systems, mind management software, online creativity application, idea clouds…).

Outputs
- *Structured and accessible information* is defined as easy research and quick access to required information and/or documents
- *Maintained information* is defined as up-to-date information on the team (accuracy, transparency and consistency of documents). Information management also processes the outputs of the processes of Goals, Task Management, Decision Making and Meeting Management.
- *Improved Team Performance* defined as higher motivation, satisfied team members, reduced costs, working on schedule when not wasting time searching for documents and/or working with inaccurate information.

2.9.1.   Key Performance Indicators (KPI's)

Level	KPI
1 Basic	- We have an agreed information distribution process and users using a filing system like share storage. - We use a share folder to upload documents and share within our team google drive. - We informally track variations from our document control processes.
2 Advanced	- We have an agreed process with more controlled share + collaboration functionality such as share point or google drive. - We use a tool to control versions of documents like share point. - Team members follow the information distribution process. - Team members follow the document control process. - We keep the number of change requests in the log history of documents. - We have different storage for keeping documents and stakeholders have access to documents based on their permissions. - We track variations from our document control processes using standardized templates.

Level	KPI
3 Mastery	- We have an agreed process with more controlled share + collaboration functionality such as DMS. - Team members are trained to follow and improve the information distribution process - Team members are trained to follow and improve the document control process - We use a tool to record number of change request on our baseline documentation - We use a DMS to keep all of changes on our information - We use an integrated tool to control all aspects of documents such DMS tools - We use a tool to track variations from our document control processes - We use an integrated tool to control versions of documents

2.10. Rewards & Recognition

This process appraises positive behaviour and discourages undesired behaviour. It is important to support the team culture.

Inputs	Methods	Outputs
Nominations Rules of rewards & recognition Cultural Orientations Media Competence	Appraisal Meetings Awards	Increased Team Performance Increased Personal Performance

Inputs
- *Nominations* is defined as candidates for individual or team recognitions
- *Rules of rewards & recognition* is defined as who is qualifying for which reward & recognition as defined in the team charter.
- *Cultural orientations* is defined as an inclination to think, feel or act in a way that is culturally determined. It affects areas of power and responsibility, time management, identity and purpose of life, organizational arrangements, communication patterns and so on. It is based on the *Cultural Orientations Framework (COF)* by Philippe Rosinski described in his book *Coaching Across Cultures* (2003).
- *Media competence* is the ability to use the collaboration tools in an efficient manner to communicate successfully in virtual communication interactions.

Methods
- *Appraisal meetings* is defined as the special meeting where the periodic rewards and recognitions
- *Awards* are meaningful symbols and incentives adapted to the cultural orientation of the candidate.

Outputs
- *Increased team performance* is defined in the Feedback process
- *Increased individual performance* is a higher commitment and identification of the team member with the team and the purpose of the team.

2.10.1. Key Performance Indicators (KPI's)

Level	KPI
1 Basic	- We sometimes apply the rewards & recognitions available within your company
2 Advanced	- We have formally planned targets for individual rewards & recognitions - We have formally planned targets for team rewards & recognitions
3 Mastery	- We always apply the rewards & recognitions available within your company - We have formally planned targets for team rewards & recognitions open for improvement - We have formally planned targets for individual rewards & recognitions open for improvement - We have different rewards & recognitions for different project phases planned

2.11. Ramping-down

This process manages the how the virtual team is dissolved.

Inputs	Methods	Outputs
Team charter Leadership charter Personal contributions Team Success	Lessons learned meeting Good-bye meeting	Lessons learned report „Dissolved" Teams Improved Virtual Team Skills

Inputs
- *Team Charter* is defined in the Get-to-know-each-other-process
- *Leadership charter* is defined in the Get-to-know-each-other-process
- *Personal contribution* is defined as anything team members want to share with the other team members.
- *Team Success* defined as the teams' performance, accomplished tasks, action items, risks and experiences.

Methods
- *Lessons learned meeting* is defined as a structured run-through of the project with a focus on the performance of the team.
- *Good-bye meeting* is defined as the last meeting of the team to close the team formally.

Outputs
- *Lessons learned report* is a document which captures all aspects of the virtual team performance, organizational processes, concepts, methods and experiences.
- *„Dissolved" team* is defined as the formal end of the team.
- *Improved Virtual Team Skills* defined as competencies and personal experience gained from recent virtual team experience. It includes expert knowledge as well as soft skill development.

2.11.1. Key Performance Indicators (KPI's)

Level	KPI
1 Basic	- We have an informal kick-out meeting at the end of the project - We have an informal lessons learned process at the end of a project phase or at the end of the project - We celebrate the completion of a project phase with your team simple and informally - We have a simple and informal farewell celebration when a team member leaves the virtual team
2 Advanced	- We have a formal kick-out meeting at the end of the project - We have a formal lessons learned process at the end of a project phase or at the end of the project - We sometimes stay in contact with your virtual team members after the end of a project - We have a simple and formal farewell celebration when a team member leaves the virtual team
3 Mastery	- We have a formal kick-out meeting at the end of the project with approval process - We have a formal lessons learned process at the end of a project phase or at the end of the project with approval process - We celebrate the completion of a project phase with our team formally with approval process for next phases - We have a formal farewell celebration when a team member leaves the virtual team - We always honor the contributions of a team member leaving the virtual team

3. Domain Tools

This domain describes the possible tools for a virtual team and how they could be used. A virtual team has basically the choice between synchronous media and asynchronous tools.

- Synchronous tools cover:
  - Telephone
  - Videoconferencing
  - Online collaboration tools
  - Chat
  - Application sharing

- Asynchronous tools cover:
  - E-Mail
  - Mailing lists
  - News groups
  - Websites
  - Social Media Networks
  - Databases

There are some hybrid tools emerging, such as virtual team collaboration portals.

The virtual team uses for different tasks the correct tool. There are tools for creativity, collaboration, socialisation, reviews and document management in place.

4. Culture

The culture of the teams depends on many factors. Below is a list possible influencing factors:

1) Personal experience with virtual teamwork. How much experiences have the team members with virtual teamwork? Are they familiar with the different concepts, processes and tools? What positive or negative experiences did they make during their lives in virtual teams?
2) Learner Types. How do the team members learn? Are they learning in a similar way or do they have different needs on how they acquire new information?
3) Cultural Orientations. Where are the team members from? Are their cultural orientations alike or different? How much can the team members move toward the other team members?
4) Coordination. How is the coordination done in the team? Is everybody involved in the coordination? Does the coordination style reflect the cultural orientations needs of the team members?
5) Treating people equally. Are virtual meetings scheduled in a rotationally mode or are some team members always at an uncomfortable hour participating?
6) Leadership. How is the leader skilled to lead the virtual team? How can the team members contribute in team decisions? How much personal freedom is given to each team member? What is the mind-set of the leader towards all the team members? How are concepts such as transformational leadership or elective leadership implemented?
7) General tasks. Do the team members have the right competencies for the tasks? Are the tasks equally distributed? Are the responsibilities clearly defined? Are the expected quality criteria defined?
8) Motivate. How is the motivation of the team? What are the trends? What can the team leader the team members do to increase the motivation of the team?
9) Develop. How can we increase the performance of the team members so that they can learn something on the project?
10) Availability. How easy is it to get in contact with the team leader and with other team members? On which communication channels are they available?
11) Influencing. How can the team member influence each other in a positive way?
12) Integrity. What are the individual values of the team members and what are the values of the team? How fair does the team exchange difficult information? How congruent are the team members and in particular the team leaders behaviour?
13) Learning. What opportunities do the team members have to increase their skill levels? How can the team leader and the team members support each other learning?
14) Netiquette. What is the norm for respectful communication in the team? How is it defined?

All these elements define the culture of a virtual team. A positive team culture will result in trust and commitment.