Professional MBA
Automotive Industry

PROJECT MANAGEMENT IN MULTI COMPANIES & PRODUCTS GROUP

A Master's Thesis submitted for the degree of
"Master of Business Administration"

supervised by
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Bratislava, 15th of September 2014

Affidavit

I, **ING. IGOR SUBA, Ph.D.**, hereby declare

1. that I am the sole author of the present Master's Thesis, "PROJECT MANAGEMENT IN MULTI COMPANIES & PRODUCTS GROUPS", 65 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and

2. that I have not prior to this date submitted this Master's Thesis as an examination paper in any form in Austria or abroad.

Vienna, 15.09.2014

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Signature

Acknowledgment

Abstract

Project management is almost a scientific discipline today. It is one of the fields where the practice hounds the theory. Pulse of industry of European automobile producers and sellers is so fast and dynamic as a result of the change of global conditions that the times when the theory described the processes and methodologies were set and then applied are gone a long time ago. Today this synchronically ticking organism dictates the trends in the sphere of development of supporting tools for the management of all the processes which participate on it. According to the theory of management the challenge for managers of the 21st century is to get over the failure. At the present the survival of automotive suppliers is conditioned by the ability to create a successful result from a lot of successes and failures in the individual sections of separate projects and by the means of proper project management to transform acquired nomination into successful supplies in the course of whole duration of the production.

The thesis deals with the description of one of the ways how a tool for the support of project management and administration processes can be created in order to enable the owner of the process the so-called project manager to be successful.

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Abbreviations

Dimense++	ERP system
EDI	Electronic data interchange
ERP	Enterprise resource planning
Excel	Microsoft sheet calculator
GUI	Graphic user interface
KWT	Calendar Week (German)
Outlook	Microsoft email client
MoM	Minutes of meeting
MSP	Microsoft Project software system for scheduling project
PLM	Product lifecycle management
PM	Project manager
SAP	Systeme Anwendungen und Produkte (ERP system)
Sharepoint	Microsoft enterprise company infrastructure platform
RPLAN	Software system for scheduling project
SQL	Database system
SOP	Start Of Production

1 INTRODUCTION

We have been accompanied by the projects since the beginning of the world but the project management is not mentioned until the second half of the 20th century. Until that time the projects were managed by informal methods based on the ad hoc basis. The work of Frederick Taylor and Henry Gantt made an important contribution to discipline of the project management at the beginning of the 20th century. Famous techniques like CPM (Critical Path Method) and PERT started to emerge in the 50's. United States Department of Defense created the WBS method (Work Breakdown Structure) in the 60's and gradually they started to establish several project management organizations, as for example IPMA or PMI. At present there exist a number of different project management frameworks, hundreds of assistant tools and techniques for effective projects control. So why have been the project management methods developed only in the last decades and were not needed before?

Theory as well as need to manage projects and all the key changes in the company have been confirmed hundreds of times on the global projects since the origin of the PMI methodology. The magic of the project management is its success and relevance of rules of small company and change that last for 3 months for 20 employees as well as changes in global project of some infrastructure or technology on the worldwide basis in the international understanding (Y2K etc.). The theory of the project management has not been changed since its origin. The world has changed. The time which we have for the realization of change has been changed, availability of resources has been changed, ability to share and hire them has been changed.

Time period given for new products to be placed on the market has been changed especially. Today OEM automobile producers do not have time to decide strategically where; in which category is the right time for the release of new model of automobile. Some automobile factories which were the symbols of automotive recently were buried into the history by the market. Some automobile factories had to be saved from this fate by the government interventions whereas the most powerful were also included. Today the automobile factories are powered by the market. New open territories are China, Russia, Asia, South America. The markets do not ask for suitable strategies. There survive those who are prepared, able to provide that, what the customer is willing to buy in given time and given corner of the world. The paradoxes are low sell of e-automobiles, the biggest rise of the sell just in the category

of luxurious automobiles etc. Besides sermonizing of the PM methodology I will point out some opinions which represent my observations about what is the project management today in comparison to the original theory.

1.1   Objectives of the Master's Thesis

The reason for the topic of this Master Thesis is to propose an elastic and sufficiently adaptable architecture or tools, supporting today's needed supply processes for supplier of OEM producers. I wanted to describe the needs and tools sufficient to publish the environment in which they occur and what requirements must be accepted.

Their description and solution design is applied at the system vendor as a result of this work, but its meaning is more 5like a challenge for other solutions and creating a transparent space for comparing the solutions to the acute problems.

The Main Objective of the Master's Thesis:

To create elastic and sufficiently adaptable architecture or tools solution for project managers in their everyday work.

The Milestones of the Master's Thesis

- Analysis of software tools status in project management methodology nowadays
- Analysis of internal software support needs
- Analysis of customer demands
- Draft a situation of communication between customers & suppliers
- Draft a required Solutions from project managers and customers
- Create (build) a solution
- Verify solutions into a system supplier

1.2 Methods Used in Solving the Master's Thesis

- Support of my own knowledge with literature used
- Combination of my practical experience & methodology facts from literature used
- Analysis & comparation of present theory and facts
- Creation of a solution based on my professional IT skills as analyst & architect of IT solutions

1.3 Methods of Facts Processing and Evaluation

- Comparation of our internal system status and customers' feedback
- Survey creation for project managers
- Application at Tier No.1 supplier

2 LITERATURE REVIEW – THEORY AND HISTORY

2.1 History and Today situation

Chapter history of project management is only an introduction to diversification of the perspectives how the project management looks like today, particularly in the field of Automotive and especially after the year 2008. Until that time it was "sufficient" to go through the acquirement of the project management theory, to decide which from the available and tested methodology is right, to retrain the employees, to realize structural and internal legislative changes in the company and to begin implementation. Success or non-success was given in advance by the consistence, how the realization of steps was done, interest and support of top management which contributed to achieve this result.

2.2 A new point of view on PM after 2008

Project management as a rodeo [4][1]

In the first place it is needed to state that more and more projects which are changed into a program and it means that the control is divided between several project managers. It means that the project culture is being changed and we have to learn it from the beginning to the end, because the theory is one thing and the practice it is a RODEO.

It is composed of the following components:

- Barrel racing – preparation of the offer (fast, well, forget nothing)
- Team penning – determination of the team (there are really all of them)
- Cattle penning – determination of the leaders (simplification of the communication, delegation)
- Breakaway roping – realization (procedures, terms, control, results)

These are shortened "rules of rodeo" by us. To these rules belong: qualification of the employees, personal skills, seniority, personality of a person, teamwork and team responsibility, use of software tools, regulation of processes, one storage place for the documentation, integrated access, link between the project and strategic requirements of the customer, stakeholders (who they are, what kind of influence they have, how they are changed), indeterminacy of the project environment and others.

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[1] *http://www.itnews.sk/2012-06-04/c149171-dnesne-projektove-riadenie-pripomina-rodeo*

Not only project/program manager and his people but also the whole company have to be prepared for this kind of "feloniousness". It is a hard road without a compact view of the management of the company and "project production". On this road there can come into existence a number of misinterpretations, mutual misunderstanding and diversion from the road which has to lead to the satisfied management of the company – it means that the project is delivered in agreed time, with the presupposed capacities and planned budget.

As a result the established goal cannot be approached separately, but only together. Not only project team, businessmen but also top management respond to arisen changes, and it is in the time when the costs are needed to be saved and it is needed to satisfy the needs of the customers to the greater extend as we were used to. Today it is not only about the management of workflow between separate project tasks, meeting the deadlines, the costs but also about the flexibility to react on various requirements which can come into existence in the course of the project.

Common sense [5][2]

So why have been the project management methods developed only in the last decades and were not needed before? The answer is considerably simple. In the 20th century the demands on the productivity and effectivity were rising enormously. It is indubitable that today's society and organizations face much more aggressive competition in comparison to the past. It forces the companies to use more effective methods. The studies conducted in recent years show that the usage of precise PM methodology in comparison to the uncontrolled (or no) methodology can increase the productivity even by 20 up to 30 percent. Is the project management only the application of the common sense? We will be able to give the answer, if we define common sense at two levels.

1. On the first level it is a prompt wisdom,
2. Second level is about recording this wisdom in the course of the years.

Summary: both mentioned levels of common sense are necessary for the project management. The projects cannot be lead only with the obeying of instructions and commands. Equally the projects which are on a certain level of complexity cannot be lead only with relying on one's own skills however. Project management is organized common sense. In the hands of clever and experienced people the project

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[2] *http://www.itnews.sk/2011-05-05/c139736-vyuzitie-sedliackeho-rozumu-v-riadeni-projektov*

methodology offers an advice, provides the structure and ensures consistency. Clever people have learned to use the methodology and not vice versa.

Leaders are the heads of the successful companies [6][3]

Key requirement for the project manager is to be a proper leader. Why the leader? According to the president of BPUG Slovakia, Peter Balc, the leader achieves goals by the means of people he is responsible for and he cooperates with. Project manager is team builder who necessarily has to have great knowledge in the field of interpersonal relationships, besides he has to have ability to motivate, inspire and to lead the team.

One of the solutions how to deal with the project management and team leading is to apply coaching. A common feature shared by coaching and project management is work with expected or more precisely future outputs. Project manager is able to release the potential of his team with the use of coaching; he is able to lead team to accept the responsibility and to instigate the team members to their own solution of any situation. This method can be used by mature and experienced leaders who are able to actively listen and suppress directive way of the leading.

New trends in project management [6][3]

Development and systematic changes in the society force project management to keep abreast with the times and to adapt. Globalization, crisis, pressure on the expenses and time, ecology and mobility of the employees. All of these are the factors which influenced the origin of new type of the project team different in its nature. We can see virtual teams in the international companies more and more often. Author defines virtual team as a geographically dispersed team of real people with real goals who work across the organizations independent on the time and space, using modern technologies to connect. Outputs of this kind of team are real. Functioning of virtual teams is valued by many people. Their contributions are numerous:

- Possibility to get top-level professionals not dependent on the locality
- Greater flexibility, satisfaction of the employees, fast professional growth
- Decrease of the costs and time saving in the case of travelling
- Increase of the competitiveness of the organization

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[3] *Jana Balážová Ing. Peter Minárik, 23.7.2013 - BPUG Slovensko*

Every pro has also its cons and that is why also critical replies can be found and it is the result of the following reasons:

- Demanding organization of the cooperation
- Motivation and control of performance of employees
- Lack of common contact – risk of low trust and unity
- Lack of personal communication

Leadership can be understood at two levels according to them. The first one is the work and approach of the project manager as leader and the other level is directed to the firms which are composed of more leaders and they realize attractive projects together as the first in their domain. To be the leader brings not always only positives. It requires certain amount of courage to be able to inspire people in your environment, to deal with a new not researched, uncertified thought and to be able to enforce it in practice. Leadership is about ability to decide also in difficult periods of time. It is exactly this characteristic – to make a decision and especially to take the responsibility for it which makes leader from average manager.

Project crisis [7][4]

A great extent of the projects realized at the present, their complexity and very unstable environment of contemporary economics, all these factors can be the source of origin of crisis situation in projects.

It is interesting that even extensive publications about project management do not deal with the project crisis (M. Rossenau [3][5] and A. Svozilová [4][6]). In contrast to this it is important to state the fact that even the crisis management monographs do not draw the attention to the specifics of application of crisis management in projects .

A seminar dedicated specially to the issue of the operative project management drew attention to the necessity to deal with the crisis when implementing the projects. Exactly in course of project implementing itself there occurs a situation when the prioject team is not able to solve the crisis situation with the use of means available.

Definition of the term project crisis

Project crisis can be defined as the loss of the balanced, stabile state of the project which can occur suddenly or gradually.

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[4] http://www.odbornecasopisy.cz/index.php?id_document=42740

[5] [2] ROSSENAU, M.: Řízení projektů. Computer Press, Praha, 2000

[6] [3] SVOZILOVÁ, A.: Projektový management. GRADA Publishing, Praha, 2006

Project crisis has its individual development dependent on the intensity, space which it affects, and specific external and internal conditions in which it takes place.

Key identifiers of the crisis in some of its forms are:
- Loss of the bottleneck critical source
- Long-term dysfunction of project team, or loss of concrete key team members,
- Certain unforeseen negative changes in the social, natural or legal environment
- Loss of the liquidity of the investor and other threats of the failure of main goal of the project and their combinations

The fact that the project will be returned to the hands of the project team after the crisis diversion generally means that there will be:

- Increase of the project budget on the ground of covering of financial losses in the course of crisis as well as expenses for crisis itself,
- Preplanning or delay of original term of the project, because the time lost in the course of crisis solution is not possible to catch up
- Other changes in the plan of the project, e.g. in the field of resources, suppliers etc.,
- Cancellation of the original headman of the project or some members of the project team

However these facts have to be understood as the inevitable changes in the project which should be performed immediately as a result of crisis which happened in the course of the project.

The development of project management registered a significant expansion in last two decades.

The times, when the huge projects were managed by the technicians – mechanical engineering, building, IT engineers or developers who delegated themselves into these functions and called themselves project managers without any knowledge of project management principles, are already the matter of past.

Firms all over the world are the victims of projects which are constantly in the state of crisis and which cost and will cost hundreds of thousands of EUR. Unfortunately many of them are willing to finance this kind of projects and cover the losses instead of investing into the steps which cost only a fraction from these loses and which would

prevent waste of sources and save money. Reasons why it happens in this way are the result of the inability to manage the critical state of the project

Manager is not able to master multi-project management when the terms, goals as well as budget are not kept [8][7]

Management of several projects at the same time is different from the management of single business or individual project.

Limited sources

Each organization which wants to be successful must react to the challenges as well as opportunities of the environment. It cannot afford to perceive only one of them and ignore others. As a result it deals with several tasks at the same time. It deals with some of them as a project and others within the frame of linear structures and processes. These tasks compete with each other for the resources of the organizing e.g. people and money. These are however limited in each company.

Death spiral

Discontent of the employees is one of symptoms. It is followed by decrease of their performance and termination notices. Sooner or later the overall performance of the organization is decreased as a result. It has to recruit and train new employees, staff costs are increased. Performance of the company remains to be in decrease because those who leave slack off and the new ones are not trained yet.

Furthermore their employee orientation depletes part from the capacity of more experienced employees.

Multitasking

The second problem which is the result of insufficient mastering of multi-project management is incorrect multitasking. What does it mean? It means that resources, often the most valued ones, "jump" from one task which is in progress to other. Herewith the time spent on the solution of each of the tasks is lengthened excessively and the quality of the output is generally decreased.

Next problem of incorrect multi-project management is decrease of the mutual trust of the management and employees. Managers say: "Our projects last too much time,

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[7] *http://podnikanie.etrend.sk/podnikanie-riadenie/ako-sa-vyhnut-bolehlavu-z-viacerych-projektov.html*

timetables as well as budgets are generally not met and contributions, if any come, are left behind the expectations."

Solution

Uniform and united support of changes by the whole management of organization. Words say more than deeds and changes supported by the management only verbally or even obstructed by some of its members are doomed to be a failure.

Thorny path

Changes leading to successful multi-project management are not easy nor are they painless and it is not possible to realize them from day to day. The firm however which copes with them successfully will solve a number of problems – from those with management of people up to constant delay of projects and their contributions. But especially it will increase the effectiveness i.e. ability to bring into effect more projects with the same sources in the same period of time or the same amount of projects with smaller amount of resources. Last but not least it will get edge over the competing business which have not realized this kind of changes yet.

Five steps for mastering of more projects at the same time:
- *Establishing of unified system of management of priorities*
- *Establishing and respecting the methodology of project management*
- *Establishing of central organizational unit, project office*
- *Training of employees according to the accepted methodology of project management*
- *Establishing of effective and unified system of project scheduling as well as resource allocation*

The three best lessons I learned from a failed project [9][8]

Project failures aren't a total waste of time -- those experiences will help teach what not to do to make your next project a success. I'm sure your resume highlights your project successes, but all experienced project managers have been part of a failed or troubled project at least once in their careers. The 2009 Chaos Report indicated 66% of projects were either challenged or failed to obtain business goals.

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[8] *http://www.techrepublic.com/blog/it-consultant/the-three-best-lessons-i-learned-from-a-failed-project/*
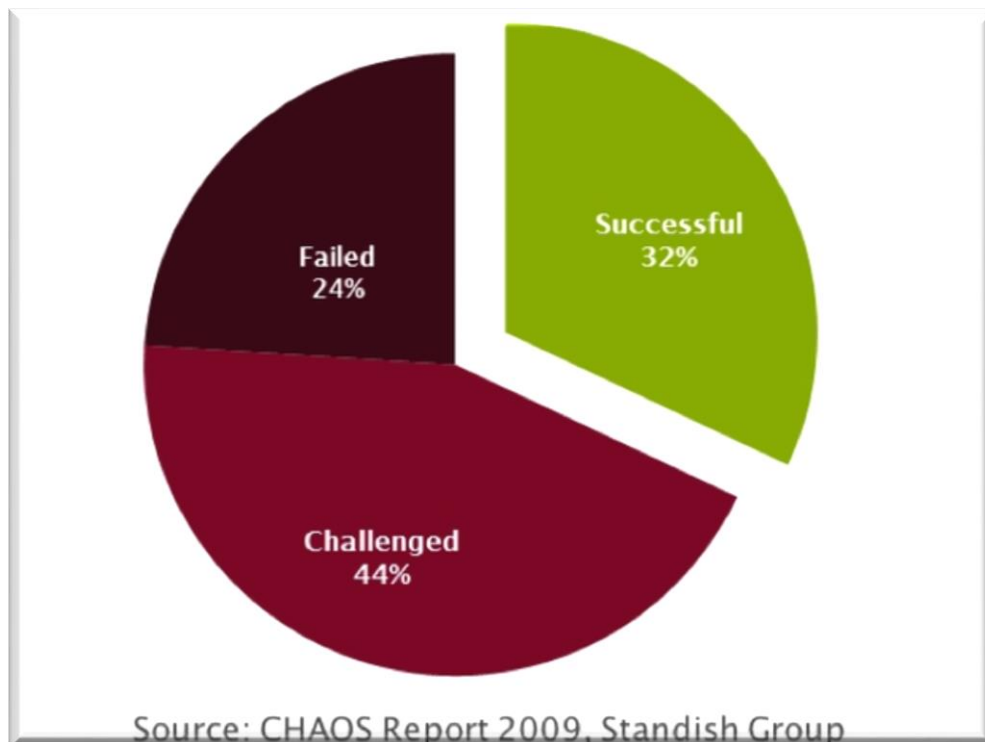
Figure 1 – Project failure chart

From the point of view of the causes project failures are categorized as disability to absorb the essential change of the scope of the project, change of key goals of the project in the course of the realization, strategic change of the direction, stopping of the supplies of sources (financial) or complete cancelling of the project. Does this sound familiar to you? Do you see yourself somewhere in between these causes of the problems with the management of Your project? Do not be ashamed and raise your hand, it is more than obvious that it applies also to your case. Probably, there exists no perfect project without any problems. Failures and problems of your actual project will make you stronger and they give you experience useful for the elimination of your future mistakes and failures.

Key takeaway: Adopt a change management process early in the program that all stakeholders will follow.

Heroism and big individual actions principally lead to the only guarantee in the project world. And it is the guarantee that the project will end in a failure. Heroes are good as film characters but project heroes have no place in contemporary world. The power of success lies in team and not in the strutting of individual's stuff.

Key take away: Build and trust an effective team.

Projects fail in the course of various phases of their life-cycle and there are a lot of theories of risk management for the elimination of oncoming threats. The only guarantee crosses all the risks and gives the power to their elimination. Well-built powerful homogeneous and motivated team. The key to the success is the use of all the mistakes in one's own benefit and transform them into common success of a team and result also in the success of the project.

How To Hire A Great Project Manager [10][9]

The problem of today's firms is the finding of right project managers. The times when the project managers were produced in the schools and courses as a wave of fashion is already gone in the field of industry. Businessmen are looking for the project managers who have got through several projects. Including the unsuccessful ones. This experience is the only guarantee and hope that the future project will be better and more successful. The methodology describes 5 ways how to find the right project manager.

Stop Using Generic Job Descriptions

Stop describing the position of the project manager. There exists no universal muster for all these positions. Each project is specific and requires individual combination of skills.

Decide Exactly What You Really Need

Have a clear vision about what you want. Agree about the requirements which the project manager has to fulfil for you. If he identifies with them you will be well on the way. If not, start from the beginning.

Critical Projects Need Dedicated Project Managers

Anything much larger, and especially critical projects, need dedicated project managers.

If You Need a Specific Methodology Used, Say So

If you need to incorporate system elements and firm standards into the project implementation, define what kind of them and how it has to be realized. It will start the

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[9] *http://www.forbes.com/sites/groupthink/2014/05/07/how-to-hire-a-great-project-manager*

congruence and integrity of the steps of the project manager and your expectations. At the same time agree about the way and form by which will be the methodology and standards required by you applied.

Eliminate the Essay Questions

Following of some of the above-mentioned recommendations, you can apply several methods and recommendations at the same time in parallel. At the same time in the course of their solution you will be embodied with another requirements for the realization. By the means of the right filtering of the requirements and good orientation in the priority scheduling of the initiatives and needs, you can find the right sequence of the steps for the management of the goals and elimination of unimportant questions and initiatives.

2.3   Supporting SW tools of project management

In the course of the time there were developed various supporting tools for project management support, even extensive systems for management and planning. Their growth was the result of growth of the number of tasks in separate projects, involvement of larger amount of project employees, internationalism of project teams, absence of personal meetings, when the project teams and meetings started to be organized and coordinated from the distance by the means of the communication technologies and last but not least with the overlap of more projects realized by a great part of the people from the same team. Other level of the pressure on creation of tools is the report need of shareholders and project initiators. The times are already gone when it was enough for the project manager to have Excel and personal computer. Even the storage of project documentation on available network-attached storage places is not enough. Today the use and the filling of advanced tools take over the routine of monitoring of tens and hundreds of tasks, terms, notifications, routine preplanning, automatic reporting of basic attributes and they are a necessary tool how to cope with huge extensive projects today.

The world of tools is more colorful than the MS Project. For the expanding of the horizons I will mention also some others, but only from the field of classic project management. Specific fields like government, building industry, and banking definitely have even more perfected tools for project management which take into consideration their specifics.

Before we start to deal with the most published list of the project management tools, here follows unorganized short description of some alternative tools:

Commercial tools [11][10]:

Clarizen online project management solution (SaaS).
Daptiv PPM online project management solution.
AgileEVM Web-oriented tool.
EcoSys EPC Enterprise Planning & Controls.
Hansoft integrated solution for "agile" and "lean" development, team Gantt planning,
UMT Project Essentials perfect tools for business planning for the MSP Server
CA Clarity PPM provides a basis for better decisionmaking about the portfolio
In-Step the tool which automatically stores all the project results in the central storage
OnTime system for project management and mistake monitoring for SCRUM teams.
PSNext software for project and portfolio management (PPM) at the corporate level
Project in a box Software for project management support lead by methodology.

Open source

OpenProj it is open source project management software similar to MS Project
Project.net offers web solution for project management at the corporate level.
Project-Open web-based software for small and medium organizations.
Open Workbench Windows desktop application which facilitates work with harmonogram of the project and supports project management.

It is hard to declare today whether the open-source tools fall behind the commercial ones in quality and support. In the case of the commercial tools there is guaranteed support, to say the truth, however, they keep behind the open-source tools in their new technology and possibilities just because of the standardization and distribution management, training, support. Open-source tools have no limitations, they start new objects of the functioning, however, they suffer from the lack of documentation and the guarantee of support of some partner is always disputable and problematic.

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[10] *http://www.itkonzult.sk/pm-sw.html*

Paradoxically integrity and compatibility have never been a problem which could not be solved in the case of these tools.

In the conclusion of the theoretical part I will deal with the publishing of general, although according to my knowledge not complete, list of project management tools. Offer is varied and range of the functionality is diverse. Each of them can be said to be the most suitable for specific environment in which it was developed and in which it is used. I want to avoid the comparison of tools. The final use of one tool or another is nevertheless determined by the external circumstances today:

- *Terms and conditions for the customer*
- *Multinational character of the group*
- *Technical support of the product*
- *Integrability into internal / external systems*
- *Reporting demands*
- *Internal platform of IT infrastructure and others.*

It was not my ambition to get a complete list. List of most popular tools is in Appendix_2 – *Figure 2 Table of project management tools.*

3   ANALYSIS OF CUSTOMER DEMANDS & SYSTEMS

3.1   Internal demands analysis

I realized basic simple research in order to find out the demands of market / customers and internal need of project managers. It was oriented directly to the statements about customer demands and internal monitoring; management needs and needs on reporting of the state of projects.

There are the results :

Question 1: In the course of project management You are mostly occupied by:
- *Observance of terms*
- *Quality achievement*
- *Organization of your own team*
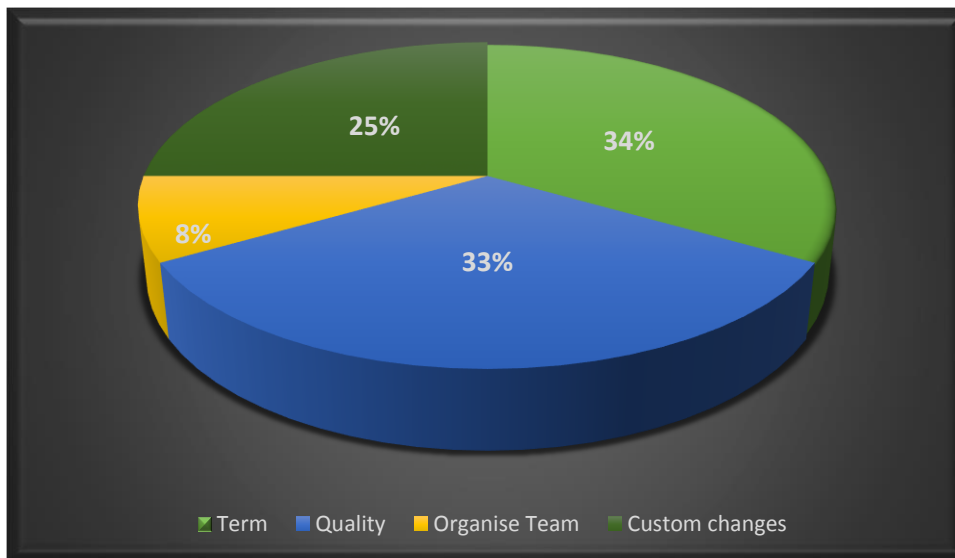- *Change of the demands of the customer*

Figure 3 – Chart representing answers to question 1 (in %)

Answer of the group of project managers is surprisingly balanced between the responsibility for the observance of terms and quality achievement. There are sufficient tools to achieve customer-defined quality in present technologically advanced time. From digital processing of the product model, over CAD construction, simulations, automatic postprocessors and machining centers generators, 3D data for scraping and tool tuning up to contactless measurements spatially resolved measurements of molded components. It depends on the process observance and

norms as ISO, TS, VDA and norms of OEM producers in order not only to produce given quality but also to preserve it permanently.

Observance of terms is a hard nut to crack in today's hectic time. Drastic term shortening of placing of new automobile models on the market and uncompromising pressure on the development terms, therms of prototypes, testing series and start of the production of new series models, are the reaction on the crisis in the year 2008. Dominance of this parameter in the research confirms the fact that it is difficult to meet this requirement and responsibility for the true choice of tools for the support of its achievement as well. As this trend could be estimated in the course of the creation of little group of questions, further questions were focused on the specification and attitude polarization, which tools are used by project managers as their own decision and rather as their intuition and which they have to use as the decision of the customer. Change of the terms is closely related to the third dominant group of answers – change of the demans of the customer. It is about the term but also term not- related changes. By the use of them the customer compensates his internal problems and efforts to put the blame for his own nonobservance of the terms, problems in the course of prototype completing, not harmonizing the tolerance of configurations and components from different suppliers, impact of new technologies on completed units etc.

Question 4 : You manage actual project internally in the environment of :
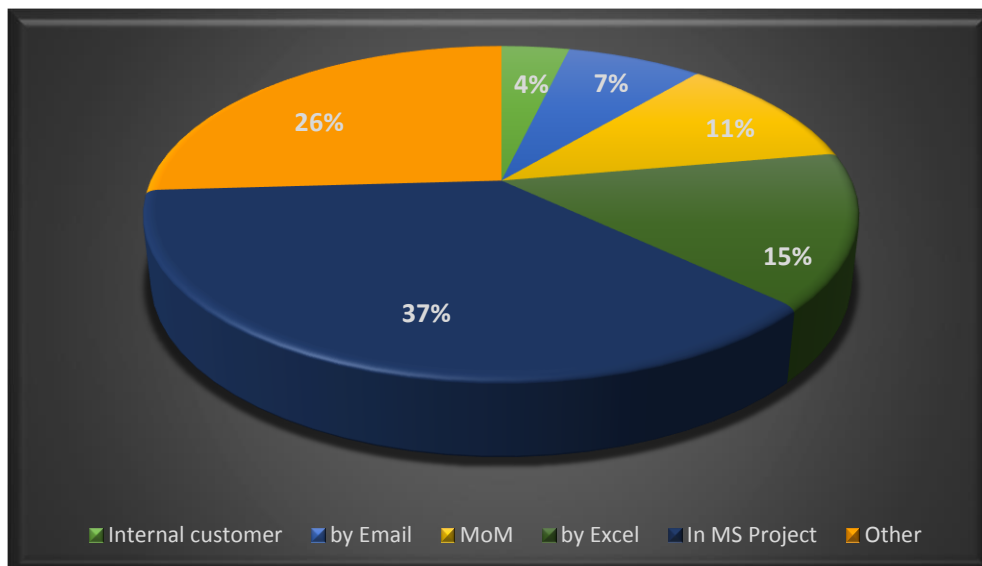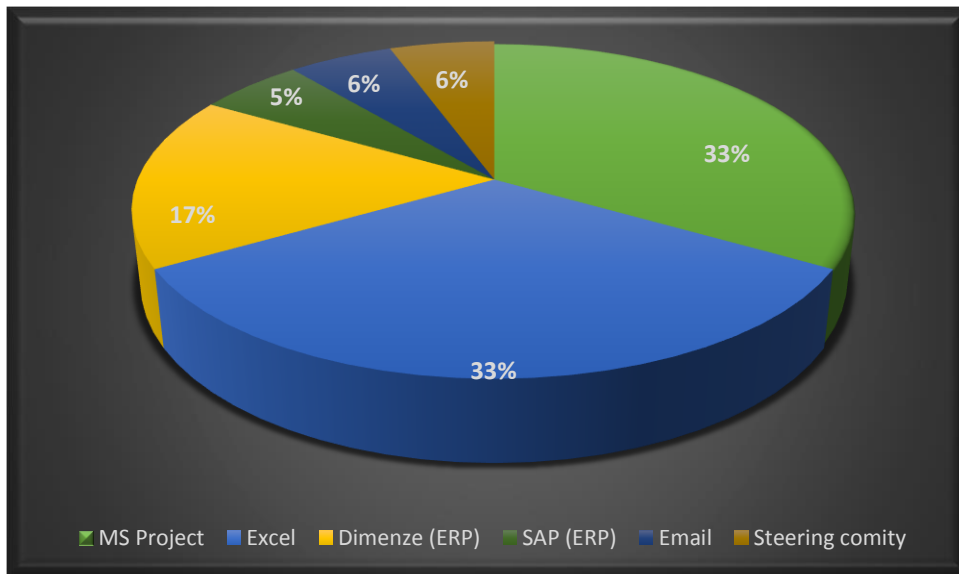

Figure 4 – Chart representing answers to question 4 (in %)

The goal of this question was to demonstrate clearly which of the tools is dominant. It was surprising even for myself that there is withdrawal of Excel and increasing

tendency to use MS Project standardized tool. The second noticeable percentage represents ERP systems themselves (Dimenze++, SAP). Today's pressure of the customers on the systematicity of processes, team organization with several tens of employees involved into the tasks extended to several tens of months force the project manager to use a tool which will provide him with the basic functionality in flash report of the state of the project, sources congestion notifications and easy replanning of the terms changed by the customers. Several tools meet mentioned requirements, however, many of them are proprietary (Enovia, SmartTeam) ...and they are more or less bound to the project type or type of processed data. However, in general understanding in contemporary state of the industry and project management development MS Project wins its position as a cause of its standardization, availability, integration and worldwide support. From the point of view of project processing and its agenda is its functionality well-arranged, available, manageable for basic certification level in 3 days. It facilitates basic time management of tasks, human, mechanical, financial resources, asignment of resources to the tasks, capa planning etc. It is relationally fixed between the project tasks, it has sufficient signalling and reporting functions. Its abilities are more or less dependent on the ability of the project manager to use it and to plan the project in detail. In the course of the coordination of management of more projects MS Project has Pro functionality – it means that in Enterprise environment architecture server – individual MS Projects Pro are coordinated and they are able to allocate the sources from each other, to solve their collision in time on the principle of machine decision making and automatically offer replanned scenarios for individual projects. At the same time this solution plays the role of basic elimination and blocking function in the case of the new project incorporation what is very important for incorrect project incorporation into unavailable capacity times or overloaded sources on which the project counts.

Question 5 : You consider as generally most widely used project management and reporting tool:
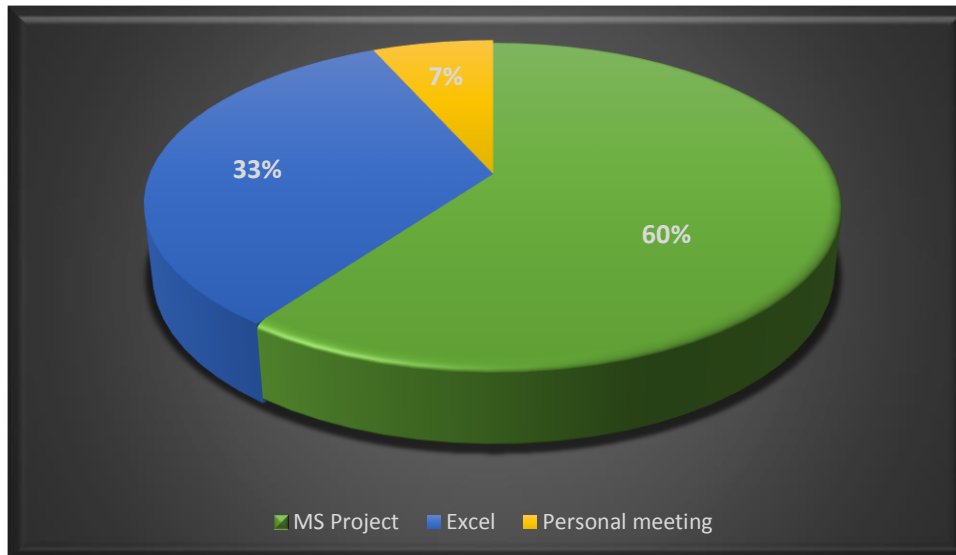

Figure 5 – Chart representing answers to question 5 (in %)

The question observes opinion of project managers about what they think about the tools serving as support for their work. As opposed to tool which they use, which fundamentally influence customer terms, at the level of manager's own decision making excel is still in balance with MS Project product. There can be felt the persistence in the use of simple native excel, but the functionality which makes the MS Project different from excel starts to make MS Project more successful. Excel has not a whole set of functions which is already a necessity today, and which are provided by MS Project in its base package and intuitive management. Therefore it is natural and obvious that the necessity to use MS Project because of reporting of the project in relation to the customer forced project managers to become acquainted with this product and to start to perceive value difference in the function of these tools and it unconsciously creates the need to reorient on more sophisticated tools suitable for their work performance.

Other groups of answers very significantly identify by their number the loss of positions of ERP systems and their modules / functionalities for the support of project management. Today the projects are not an accounting-controlling collector of the costs as in the past, when this only ability of the system besides the overall term was the subject of evaluation of the use of order / project costs. The time dynamics of the changes of customer terms in the course of the project overrun the ability of the massive ERP systems to give to the project manager a tool realizing his own project and manager needs a long time ago. The percentage distance of the separate

categories exactly represents the ability / disability of the individual ERP to assist these needs..

Question 6 : You consider as the best from all of those You know:
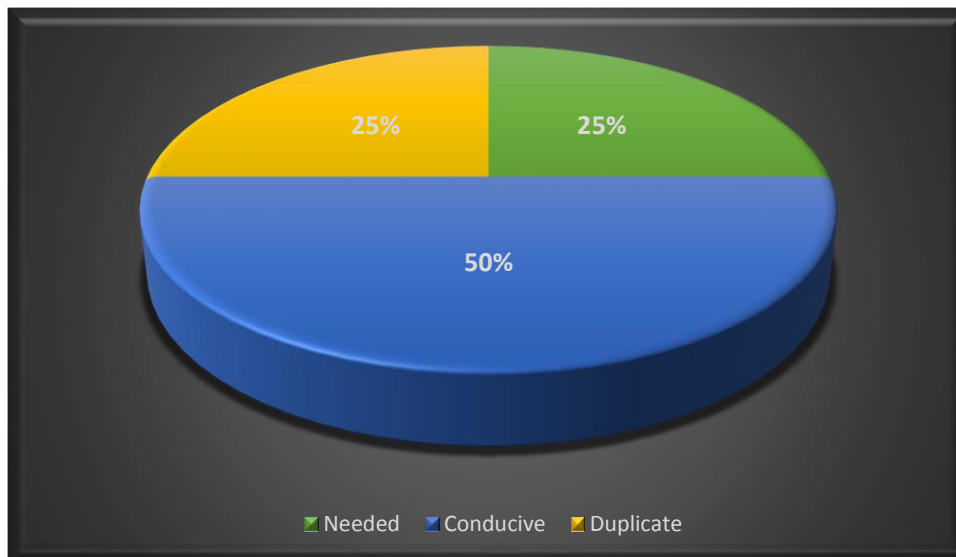

Figure 6 – Chart representing answers to question 6 (in %)

This is a shock for the supporters of their own written records and excel. At the same time it is a signal that there is massive trend in the case of OEM producers to standardize reporting and management tools as the cause of the initiatives of a big amount of suppliers. There is no other chance today when the OEM producer himself places on the market two, not rarely also three models at the same time and he has potentially tens of Tier 1 suppliers, whom he can coordinate and manage. It is a necessity for living which is in conflict with the need of their own internal tool for coordination of their own project and organizational processes. Therefore we are the witnesses of the fact that despite its expansibility and transparency MS Project is not an internal environment for project management. It creates a rather ususal situation when the overall state is reported in MS Project because of the standardization but there is different internal system (R-Plan) of the OEM producer for term monitoring which is directly entered by the suppliers. At first sight there comes into existence the duplicity of project monitoring and reporting, but that is not the case. It is the analogy of CAD systems where each of the producers, designers and developers uses for historical reasons his own system, but there are defined international standards for the unification of given data between the systems (DFX...) by the means of which given model can be at least precisely displayed in any other system, than in which it was created. Automotive MS Project plays this role in the world. It is intercorporate

but also intracorporate standard. Although there is often a different system for own massive commitment to the monitoring and control of own processes, all the other internal systems within the group are interfaced into this system. In the past Matador as such also created its own controlling, notification and reporting tool on the basis of MS SQL data which was able to include and integrate technical, developmental, strategic, marketing, organizational, HR projects etc. There is used a new combination of tools, based on the requirements of OEM standards at the present time of the Automotive groups. This combination will be described later in conclusions and recommendations.

Question 2: Reporting and maintenance of the data of actual state of the project in customer's system

Figure 7 – Chart representing answers to question 2

Let's face the truth. External pressure of the customer to insert the data into reporting system of the customer is paradoxically perceived as positive in the feedback. It surprised me as well; I am not going to lie. It confirms the historic axiom that human does not come over new things and tools and unconsciously creates barriers and argumentation against their use and leaving of customs and habits. If he is forced to do that, with the hindsight the project managers admit that when they were already forced to use customer's system and his standards, it contributed to their own mastering of project management. Positive side is the fact that they will use it from their own initiative in the case of other projects and at the same time the impact of the necessity to use standardized systems in the headquarters and first producers. There is no other way. What kind of system is used is in the second place. In the first place

it is important to have any system but for all. Unification. Dogma, on which SW giant built his world. He never sold solutions. He used to buy solutions but sold the standards. Today we have to state objectively that the way as well as decisions were successful.

It creates 75 % of respondents together with the opinion that it is even desirable. Conclusion – there is nothing else to add. Only 25 % of project managers answered that this is duplicity – their reporting into the customer's system demonstrably makes their work more complicated and there is no contribution to project management.

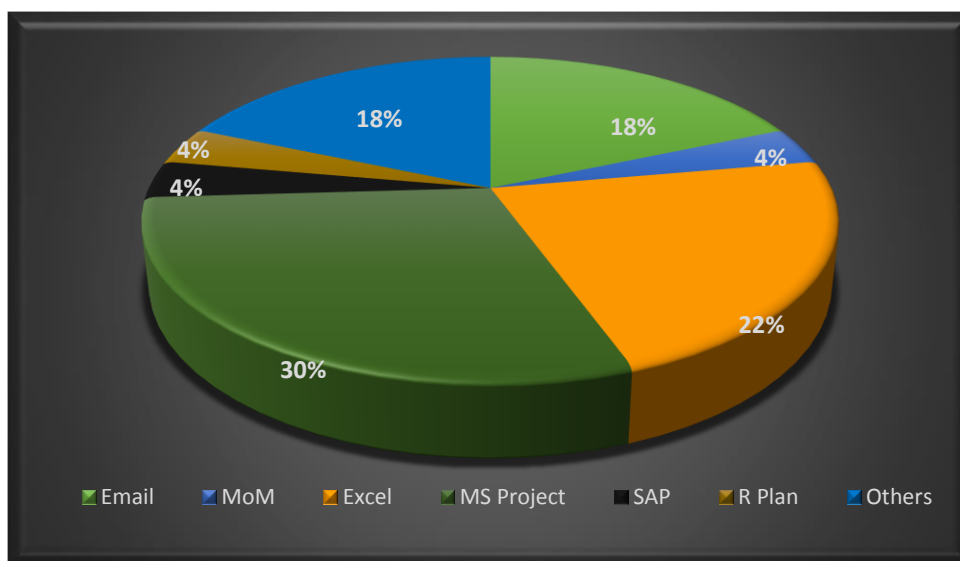Question 3 : The customer demands reporting of the project in:

Figure 8 – Chart representing answers to question 3

And what to say in the conclusion? Excel's bells tolls even if I would express the claim that it will be an emergency brake for the project manager in the tablet / notebook / smart phone for at least next 10 years for what if cases.

Arrival of the corporate systems into the routine use (not only for share holders reporting) is a condition for survival today. It is the matter of being and not-being to have a standardized portal for change of the tasks and gathering of information about the developments of orders. That is not EDI. EDI is only the exchange of information. Master tool of the project is a matter of mastering or failure at least in the field of release of new model on the market. The trend continues by the growth of internal pressure of suppliers on the creation of own portals for the coordination of own tens, hundreds and often also thousands of tasks, to fulfil own deliveries for the customer.

At the same time the suppliers stand under the same pressure in the course of the coordination of their own sub-contractors.

3.2 What environment and interface does the customer use

It's easy. Customer needs all faithful information about all parts of project in real Time. In any case the use of any tool means only different platform however, there is never difference in reporting statuses of the project. As a result we deal with an absolute mixture of all available systems internally from the side of the supplier and quite an interesting choice can be made towards the same concern in the case of different projects for different factories and upcoming models.

Figure 9 – Screenshot master / supplier meeting status

3.3 How many environments does the customer have at several projects

Today's big corporations are so extensive and in their own developmental and producing structures aggregate tens of development centers and tens of factories that they themselves also fight the standardization of the tools for management and reporting of the state of the projects. A significant part of the factories is created by acquisitions as the result of the capacity expansion of OEM producers and they are acquired including the history of all the used systems. The diversity of these systems is not dramatic, the pressure of the period and necessity of survival in the conditions after the year 2008 decimated the diversity of used systems. Today the producers fight rather with the issue of the standardization of the versions of used tools and

globalization of announced standards. If you become aware of the fact that TOP automobile producers of European format have tens of main factories and in the final effect they have hundreds of directly controlled production, logistic and development daughter factories, we are given the answer to the question whether the internal world of tools is unified. NO. In real life it happens that the same OEM uses several tools for several projects in the case of the same group of suppliers (project meeting, excel, MS Project, R-Plan). In the case of smaller suppliers the situation is simpler and a lot more standardized. The different situation occurs in the case of suppliers...

3.4 How is the coordination of several projects managed within big OEM

The supplier is in the position when each project has to be reported in the environment and according to customer's instructions and at the same time it is liable to internal firm standardization of the reports in relation to the management regardless of the system required by the customer. Ideally it is one platform, but two reporting worlds. In the direction of the customer it reports the project state, internal need of the resources, problems with resources, delays of the tasks, reporting, notifications, project team organization, subsuppliers cooperation, costs.

The supplier has to master cornerstone of project management in order to master all the projects of his suppliers:

Resources
- *People*
- *Equipment*
- *Materials*
- *Cooperators*

Time
- *Tasks*
- *Dependencies*
- *Critical Path*

Money
- *Costs*
- *Contingencies*
- *Profit*

Scope
- *Project size*
- *Goals*
- *Requirements*

For the support of project managers the IT department of the company has to secure the deployment and especially integration of following tools in order to capture all the customers' requirements:

- *R-Plan*
- *Microsoft Project*
- *Microsoft Project server*
- *Microsoft SharePoint server*
- *Microsoft Exchange server*
- *Microsoft SQL database server*
- *Microsoft Outlook*
- *Enovia*
- *Smart Team*
- *Excel*
- *MoM project meetings*
- *Email conversation*

Their mutual integration and their incorporation into project and linear structures of the functioning of the company is the individual choice of each of the suppliers. It is not possible to be able to report the project to the customer systematically and not to have developed and used sufficiently advanced system for project management. The goal of the system is to be able to get over the demands placed on the project within the frame of internally assigned sources of the company, to solve the conflicts with other projects related to the need of resources or their unavailability because of other reasons.

Individual tools and their use in relation to the involvement into the project is represented in following picture. It describes the preparation phase when the supplier applies for the nomination at the customer. MS Project is integration tool for both sides at this phase. There are key milestones and individual parts of the project in it which are the subject of offers. After acquiring of the nomination of separate parts of the project, the project is planned into MS Project internally because of the creation of basic capa planning of machine and technological capacities. After the basic and preliminary confirmation of the nominations MSP is internally scheduled in detail to have required level. Simultaneously due to the administration of hundreds and thousands of notifications there is created a transparent tool and environment of project reporting for all the involved workers and owners (share holders) a new project plan is integrated in MSP into the Sharepoint environment. This tool mediates basic information about the individual tasks for the whole group of involved workers and

owners, therefore also employees who do not have MS Project at disposal. Sharepoint deals with task scheduler, notification, reporting, graphical presentation extension and the system of task cancelling for involved team of unlimited size. At this phase the MS project file is owned and actualized only by the project manager or his administrator.

After the project initiation there comes a phase where the state of the project is reported to the customer on his portal. It is usually MSP or RPlan in the case of the latest projects. At this time the project manager is responsible for reporting of the state of the project with the periodicity of 1 week. If there is other tool used internally the project manager's duty is to keep both systems synchronized. There are possible tools for automatic synchronisation, however effort to control automatic tool requires nearly as much effort as manual actualization in two systems. There are used rather control automatisation tools which only signallize status divergence of both systems.

Technical parts of the project, administration of CAD data are generally resolved by NX platform (Siemens) or Catia (Dassault) and data administration over them Enovia or SmarTeam. This part is pretty separately included into the overall integrated system of project management.
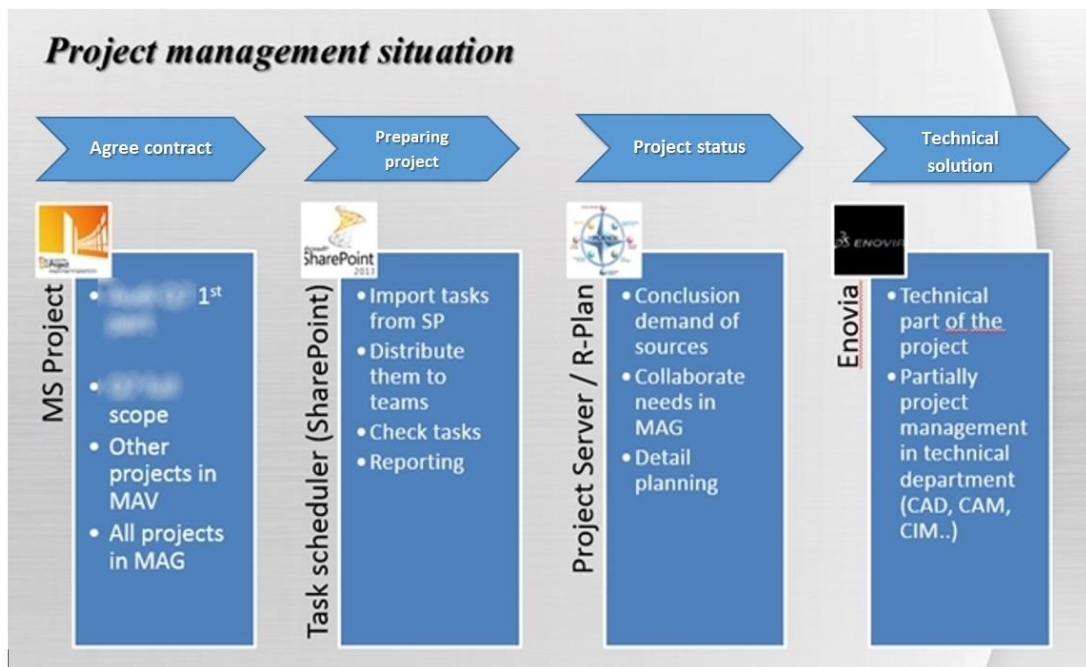
Block scheme for build solution :

Figure 10 – Platforms of project management tools

3.5 The grade of internal integration of several project management system

How does it actually work then? On the following pages there is the genesis of procedure and continuity of the preparation, planning, realization, notification, reporting and projects tasks amendments projects.

Solution description

The customer specifies his key terms (SOP) in MS project file and structure of the main milestone project. Generally it is a start of choice of suppliers and division of individual component parts and components between them. Basic master MS Project file is generally defined by the customer and individual suppliers compete to have its partial parts
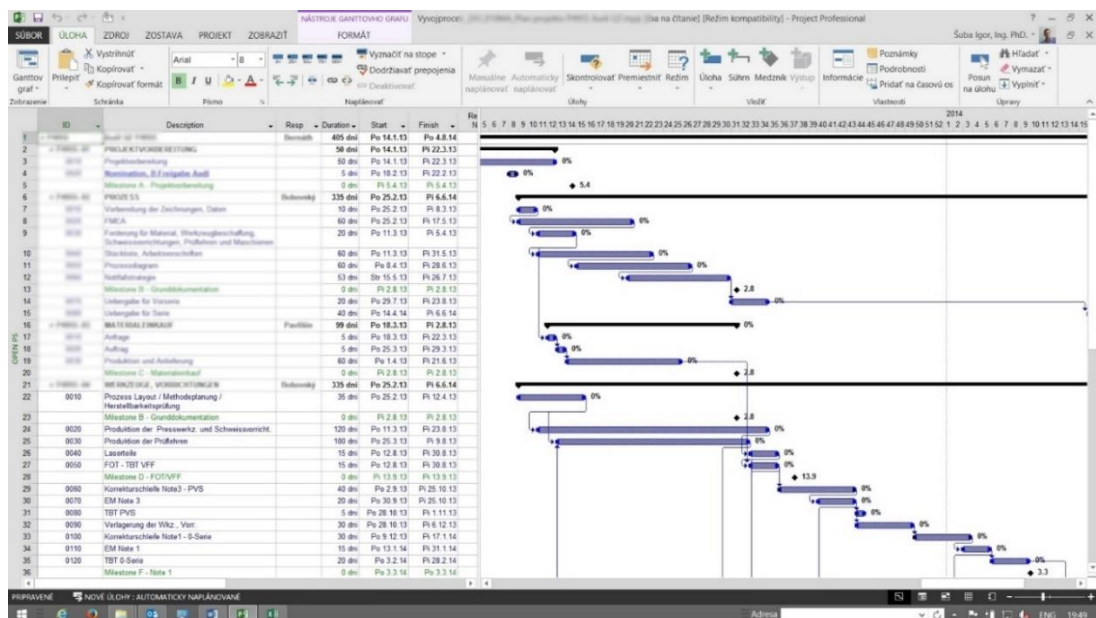

Figure 11 – Microsoft project GUI

After that separate component parts and configurations are scheduled in Excel into individual calendar weeks (KWT) for the whole project duration.
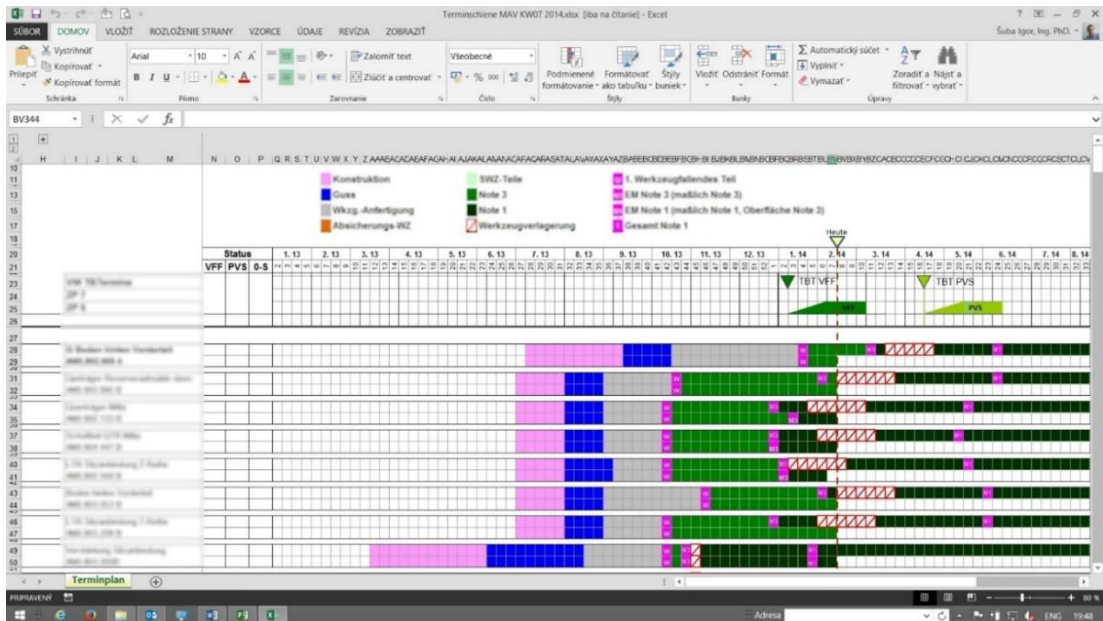
Figure 12 – Sample timetable chart for components delivery

As a result for each of the component parts there is separately monitored component part / configuration which together with tool production create a separate project within the frame of the whole project program (new model of automobile).

Excel or other more sophisticated solutions like MS Project or R-Plan tools are alternately used for monitoring of these terms.

Figure 13 – Screenshot from Actano RPlan

At the same time the monitoring of tool production and cooperation is realized in separate files, most often with the use of Excel due to the coordination of usually Asian suppliers who are not very well-experienced in the field of certification and deployment of the quality systems.

Figure 14 – Screenshot Time plane for delivery of tools components

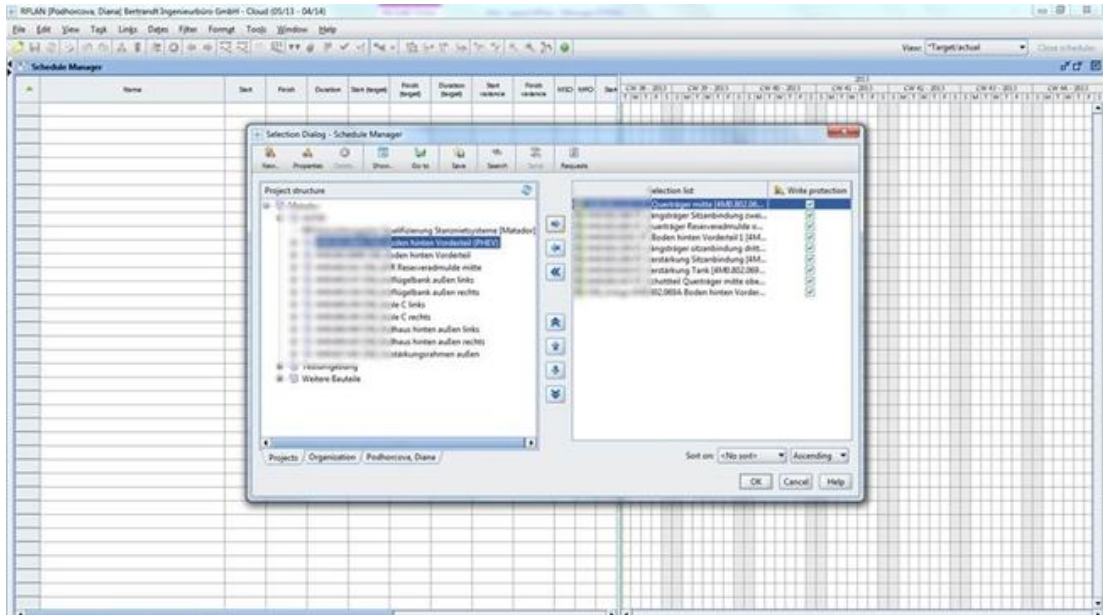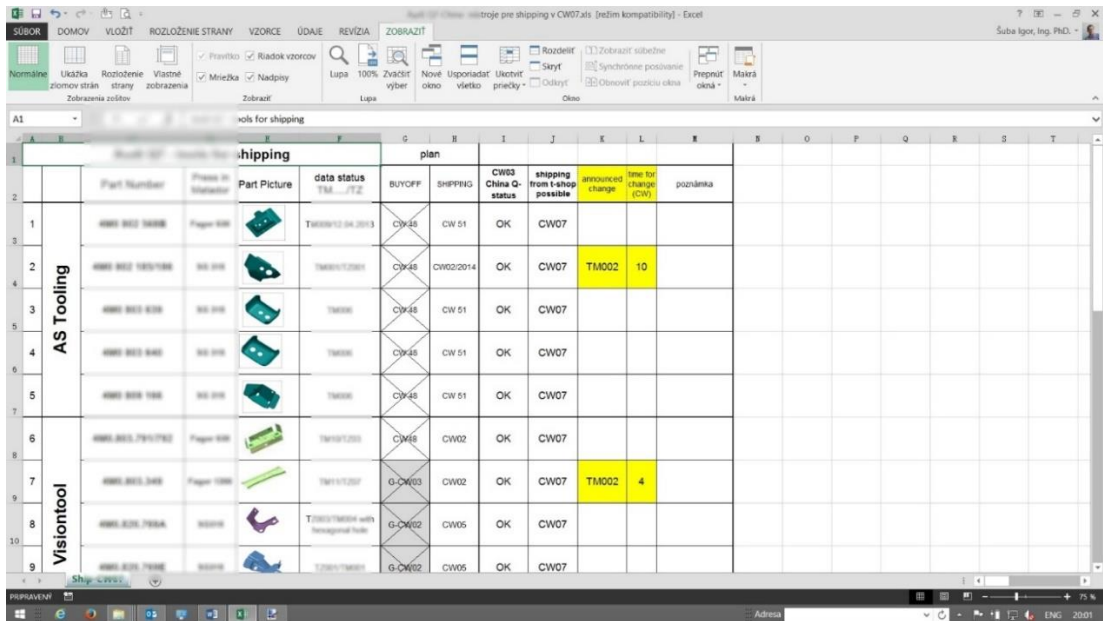Overall scope of the project is monitored in superordinate system. Generally it is MS Project file due to the transparency and clear intelligibility of the overview of the state of the fulfilment of goals, in some projects they relied on the at this time less-used R-Plan. The result in case of both systems is principally the same - it presents overall view of the state in which are individual configurations as well as the project state as a whole.

This philosophy of project monitoring and the choice of reporting tool is strongly-dependent on key project manager and not on the standards of the firm, as it would seem at first sight and as would be expected from multinational corporations. It is not unusual that in the course of the project life-cycle the focus on the importance of individual management and reporting tools of given big project is changed depending on the person leading the project. In the case of new extensive platform projects there are used several different systems at the same time depending on the point of view of customer's acceptance unit. E.g. planning prefers different tool than the development or procurement department in the case of the same project. It is not unusual that the supplier is able to trace also partial internal rivalry between these units in standardizing of the project monitoring platform of the whole firm within the frame of customer's alliance.
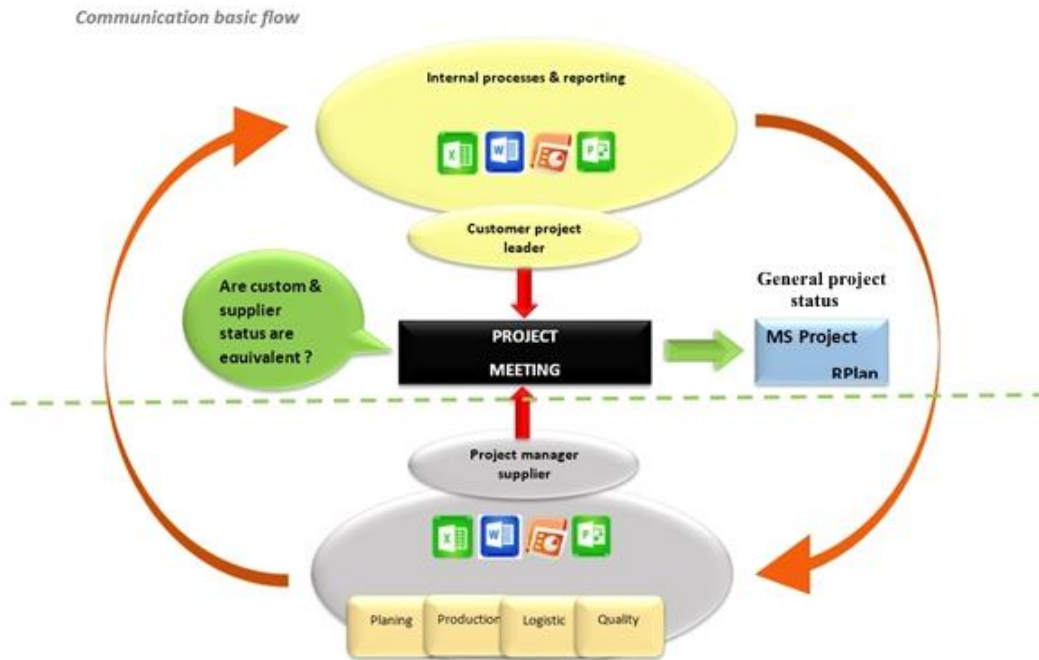
Communication matrix in large project :

Figure 15 – Project communication matrix

3.6   Restrictions of different business types

Another factor that cannot be overlooked for the project management tools integration in the group of more suppliers' companies is the diversity of individual projects especially from the point of view of project type and length of its life cycle. It is not a rare situation when one big OEM nominates simultaneously the same supplier for the supply of the developmental work, tool production for molded component parts, supply of molded and welded component parts as well as the supply of robotized automatic lines for the assembly line. Each from these supplies – project has completely autonomous and independent life-cycle, not dependent on other projects, despite the fact that it uses the same model and for the same OEM. They have only SOP and some imperfections in common (the term of the debugged tool overlaps with the supply term of test component parts for the prototype etc.). Some projects last 3 months, some 18 months and some 60 months. Harmonization of sources requirements is difficult already under laboratory conditions, which never exist in reality and in constantly-changing terms of the customer, what was proved also by the research realized among the project managers.

The situation is rather complicated when these projects are realized by one supplier in one big factory. When we add the complexity of the organization and coordination of several factories in different states with various firm and mental differences, we have the issue itself which has to be solved. We have several levels of the need of synchronization, unification and coordination of the project tasks, and we did not pass the line toward the customer yet.

The goal of project management TODAY is managing of all these requirements in the customer-given time with the use of reliable and tested tools of project management. Today the goal of project management is not to use standard tools and to observe project management methodology but the ability to flexibly model the use of all tools in given time and quality. The costs of projects, until recently the main bone of contention, is receding into the background at present and there dominates the ability of supplier to orient in customer's requirements and observe his needs without the failure of management and quality parameters.

3.7   Overload of sources - ways of elimination

How to optimize the load / overload of sources?
After the crisis and revitalization of reduced Automotive structures OEM and suppliers survived in a good cleansed condition. With structures flexible enough, accrued capital but together with one short-coming – the same human resources. The crisis did not change the division of the powers neither the abilities of managers to orientate in the whirl of changes in the field of Automotive. More or less the same leaders stayed in their seats on the positions of big corporations. It is understandable that the mortgage crisis caused the origin of global economic crisis on one hand, but its starter was not the Automotive industry however. On the contrary, together with the electronic industry it was one of the starters of its recovery. Quick ability to restructure the sources and shortening of the time of change and release of a new model on the market was the way out of the crisis. As a result the only source which Automotive structures were not able to operatively and sufficiently dynamically change are human professionally proficient resources. How to solve the problem of the overload of key employees of the company in the case of decisive project for the supplier then?

Push the term of his engagement on the project on the right side or realize workload of given employee across all the projects and start to coordinate his load with other project managers?

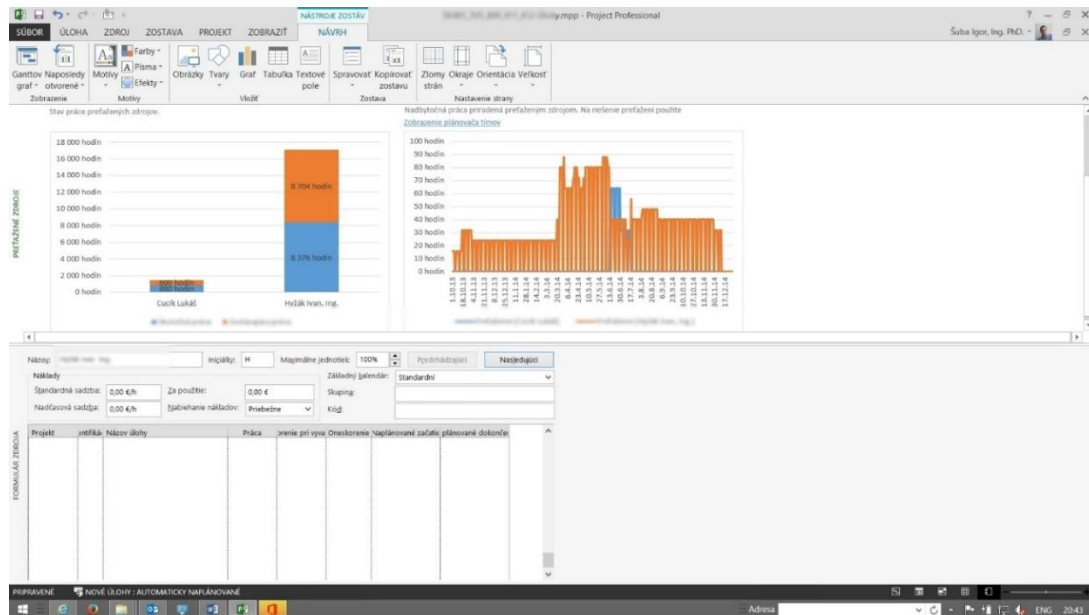## 3.8   People utilization optimization – draft of solution

Figure 16 – Screenshot MSP result of utilization source

Neither of these textbook possibilities is real in contemporary world.

The most realistic scenarios:

- Agreements with the customer on the mutual modifications and acceptable balancing of individual parts of the project in relation to real distribution of the sources. The source of the motivation of this solution is understanding of the fact, that with the ignorance of the sources overload not only the supplier but also the customer will not be able to do their work in time. He unconsciously or deliberately counts on it and therefore he keeps the term reserve on his side. Thereby he shortens the real time for the realization of the needed works in the project from the side of the supplier and gets him under the groundless pressure and overloads his sources already at the level of the project planning. Paradoxically for these security reasons it causes delay of individual tasks planned by the customer, not planned in the case of the supplier.
- Not to integrate given employee into the project because his planning in critical inaccessible time will nevertheless bring expected project result. Despite all

the rational arguments and recommendations for the methodology, this method is not applied, as far as proficiency, experience from previous projects are irreplaceable arguments for the nomination of substitutes or not involved colleagues. Typical situation is that of the welding engineer for example, whose uniqueness is given by his competence resulting from his position. It is rather impossible for the supplier to realize more extensive project of the supply of molded and welded configurations for Automotive without his participation.

- To leave overloaded sources in their original planning – permanent delay of ALL project-dependent tasks. In this case it is already the resignation of project managers who get into this situation and they do not make the use of other possibility or have no competence to change given situation. The result – demotivated project manager but also whole project team.

Based on the experience, unfortunately, we have to state that the last possibility occurs unplanned the most frequently in real life in Automotive.

4 PROPOSED SOLUTION - SUPPORTING TOOLS OF PM IN HYBRID ENVIRONMENT

In order to provide all the customers' requirements, internal integration requirements, reporting, notifications, project planning requirements we came to integrated quadratic solution of 4 basic tools. Their mutual integration and usage in corresponding phases of the project has proved to be a model able to absorb changing requirements of the customers and eliminate the impact of delayed terms with regard to originally-planned sources.

Schematic representation of the interconnection between the tools is represented in the following picture:

Final supplier solution :
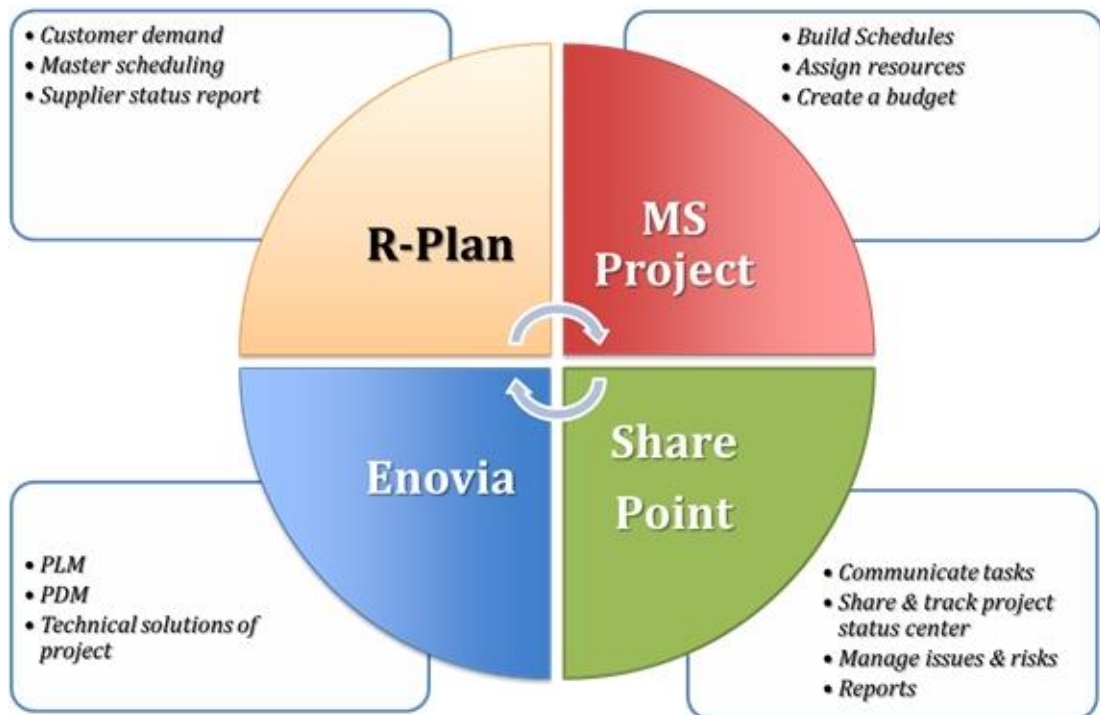
Figure 17 – Tier 1 supplier - final platforms solution

Individual tools realize following key operations in given life-cycle of the project:
MS Project :

- *Build master schedules*
- *Assign resources*
- *Create budget*

SharePoint

- *Communicate tasks*
- *Share project status*
- *Track scheduling*
- *Issues*
- *Reports*

R-Plan

- *Customer demand*
- *Master scheduling*
- *Supplier status reports*

Enovia / SmarTeam

- *PLM*
- *PDM*
- *Technical solutions*

Draft solution :

MS Project with its master plan remains the only praised program for the project manager, because of the ties it is integratedly included into the Sharepoint. After its integration project manager is the only one who can update given tasks and their attributes whether in Sharepoint or directly in MS Project directly installed in it. After saving of the change in any of these tools, interconnections are automatically actualized into the other environment and automatically without any human intervention they are actualized and all the notifications about the modification of all tasks on which the realized change had impact are sent.

This is the result of integrated environment, which we created in the significantly diversified environment of Tier 1 supplier and which helps us to deal with today's not easy situation in which we find ourselves as the supplier in the course of supply into OEM automobiles

5 MODEL IMPLEMENTATION - SW SUPPORT REALISATION TOOLS (EXPERIMENTAL SECTION)

We used a transparent tool which is available for all employees – Sharepoint for internal integration of all projects their scheduling, notification of all involved employees. It is a tool which is integrated into the systems of the firms which is able to collect data from ERP systems, MS Project systems and with the use of its own tools or Intranet portal it is able to make them available for employees. At the same time we decided for its usage because of the workflow facility for the notification of on-coming, on-going and not completed tasks, for commenting and cancellation of not completed tasks directly in the Sharepoint or Outlook environment (our decision has passed after the approval of project manager or Sharepoint administrator and not by the Outlook user with the use of Task).

The integration itself is based on the native functionality of SharePoint Enterprise on the server and its ability to integrate into itself the tasks from MS Project Pro. With Partial Add-on solution for the automation of the integration we assured "link" of finished MS Project plan into the environment of integrated Sharepoint of the whole firm.

5.1 Tools for planning

The customer specifies his key terms (SOP) in MS project file and structure of the main milestone and all project tasks. In first order customer creates a Master plan of project in MS Project format.
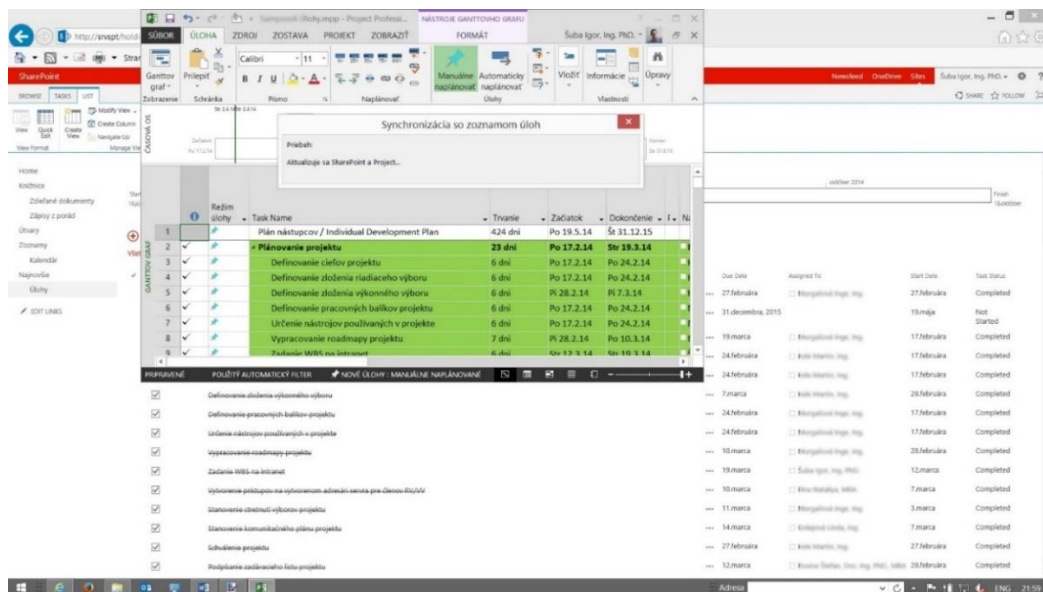
Figure 18 – Integration of MS Project into SharePoint

5.2 Tools for Tasks scheduler

Consequently we acquire a complete list of individual tasks with all the needed attributes for the monitoring of Sharepoint.
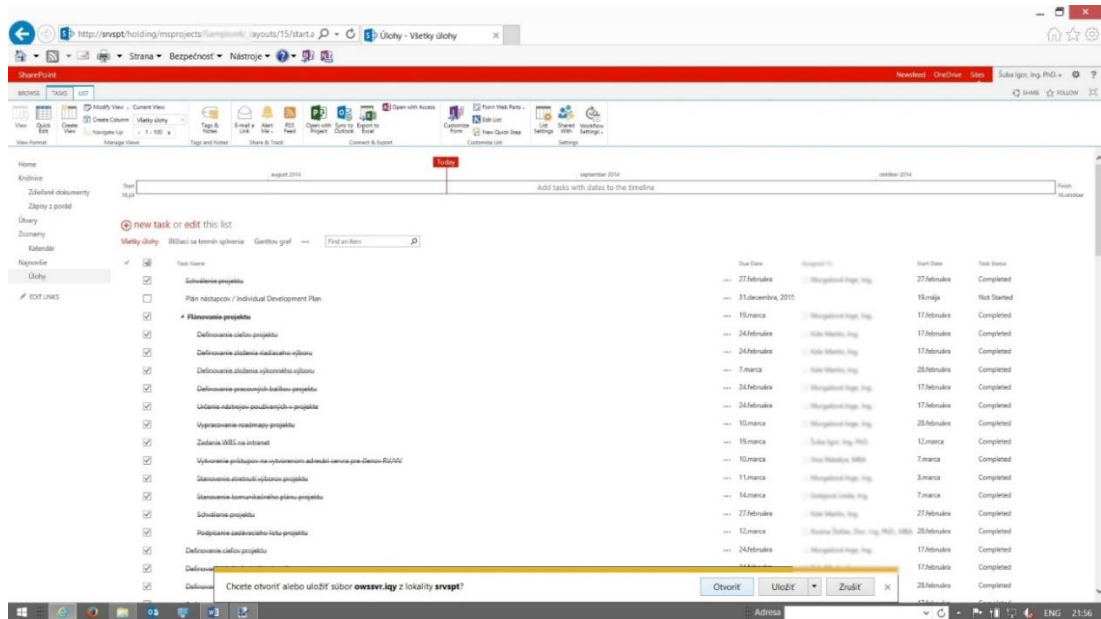
Figure 19 – Sharepoint tasks list screenshot

5.3 Nitificatrion tools

In the attached picture there is a list of project tasks, integrated link from MS Project and displayed in Sharepoint (web browser Internet Explorer). Each task has clear begining, end, name of responsible person and task description.
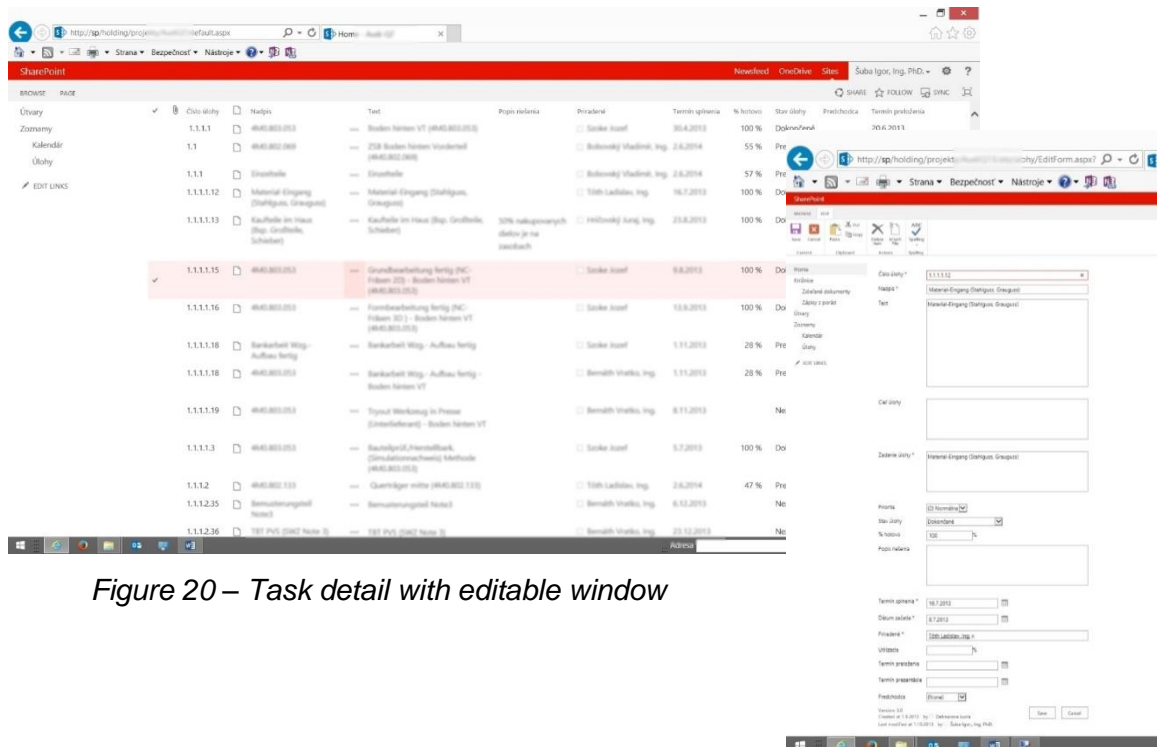
Figure 20 – Task detail with editable window

User is notified about each him allocated, on-coming, on-going or not completed task by the email notification with a concrete link from Sharepoint for given task with the description of basic status of the task (it comes on, it is going on, it is not completed).
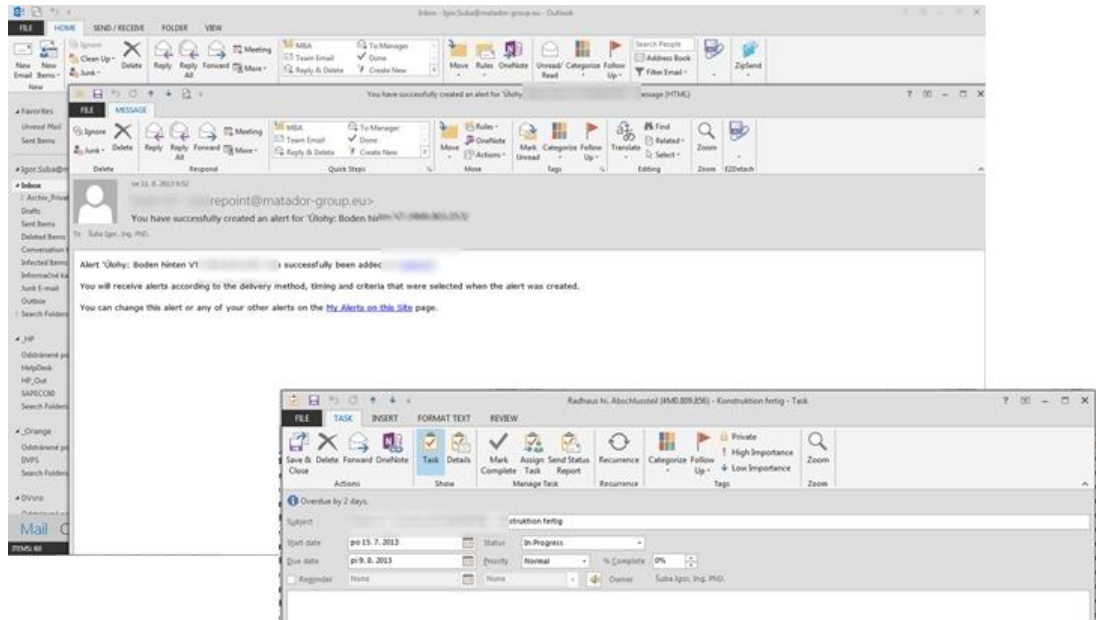

Figure 21 – MS Outlook notification email with task link

It is not the duplicity because the data are integrated and synchronized automatically in the background but in contrast to MS Project tools we needed to distribute and notificate assigned tasks via email to the hundreds of involved employees who do not dispone with the MS Project tool neither with its plan in their workstations.

In the case of need or other summarizing or reporting of tasks the list of tasks can be exported from MS Project or Sharepoint to Excel.

Figure 22 – Export of tasks from MS Project/Sharepoint to Excel.

5.4 Reporting

At the same time we have realized basic extension of online-generated graphic display and state of the completion of individual tasks, as well as central semaphor on the basis of agreed rules for the state of projects with one basic signal

The view on this dashboard of the project shows

Basic status according to set rules green / orange / red

Graphic representation of the tasks completed / on-going / delayed

Overview of individual categories of tasks in line aggregated note under the graph.

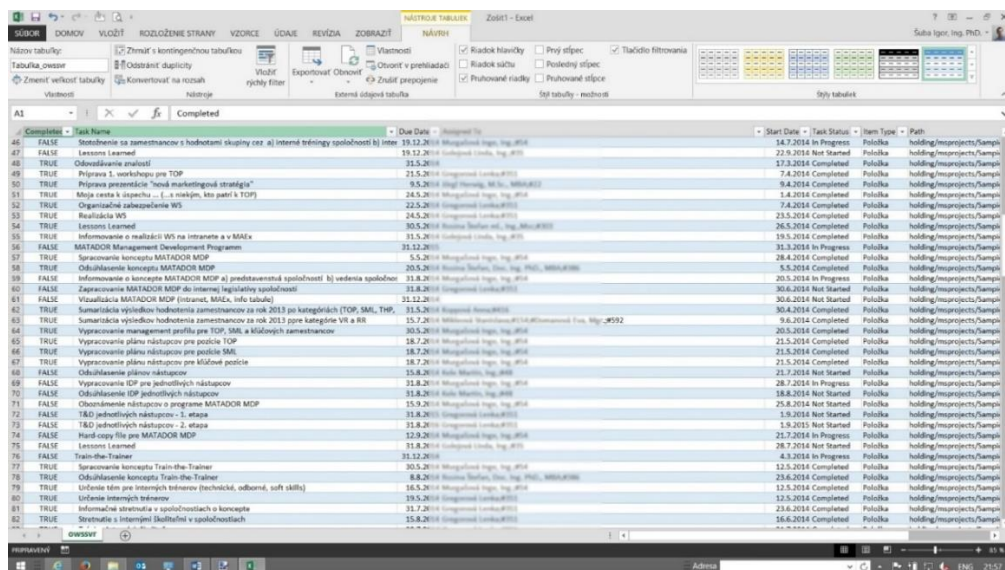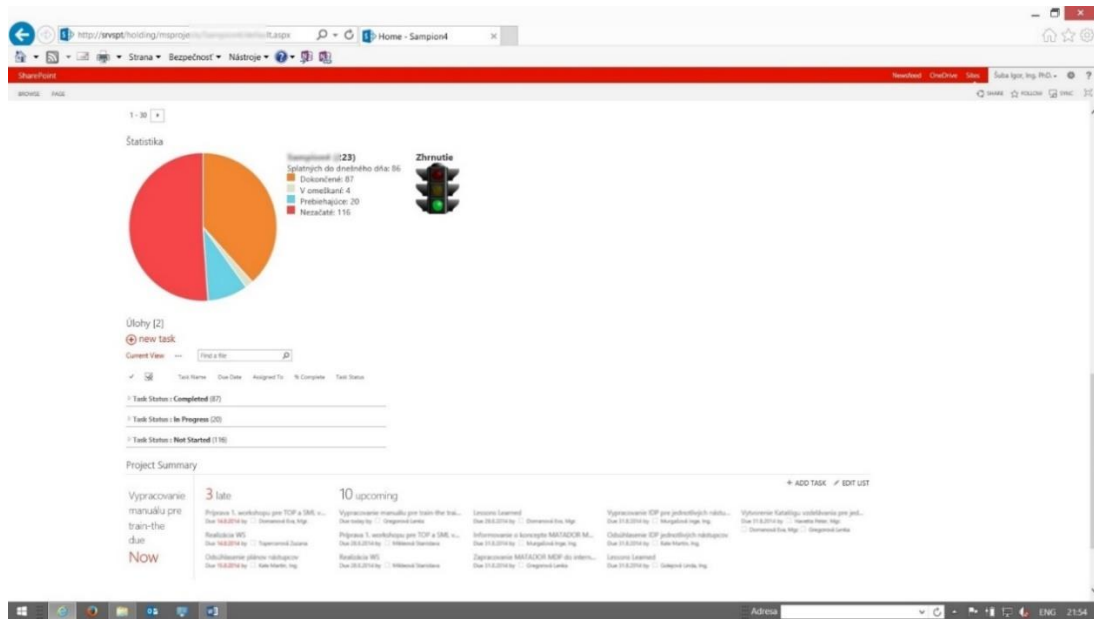*Figure 23 – Graphic report extension in Sharepoint*

This will be the end of the overview of established solution. I described mutual interconnections, system synchronizations and I pictured user-interface environment for team members.

5.5 Customer internal interface engine

As the customer controls term plans in him-fitting environment within a group, which is not master project plan in MS Project, but in RPlan environment instead, the customer has to keep the integrity of the data reported into both systems. The state of separate tasks is reported into RPlan via the customer Interface, in MS Project overall state of the project is declared with the emphasis on the disponibility of sources in capa planning. It is not duplicity or contradiction in reporting, big corporations deal with tens of projects, overlapping of several models and in the case of such great extent of coordinations, little deviations in the functionality of individual tools are

reflected in decision-making process, on which part of monitored data can be used which tool within the scope of corporate projects.

There has been created an integrated tool for reporting of the state of reported terms in customer's RPlan. The data are linked online and it is displayed in flash form on the level of signals, the state of terms of individual parts and discrete number of separate tasks with the expression of delay in this tool
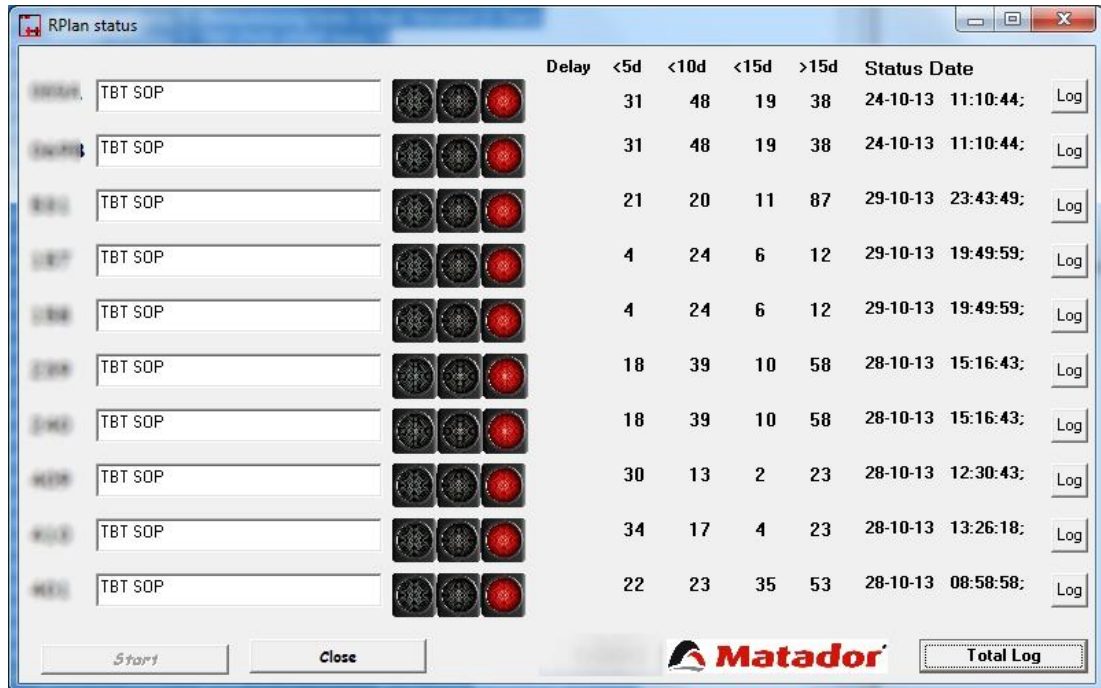
Figure 24 – Graphic status of tasks deadline from RPlan

5.6 PM integration into a management structures

How to incorporate properly and especially on the long-term basis project management into line management structures which are still prevalent in the management with their line structures and methods in todays hectic time in the field of Automotive in Europe?

Complexity of the implementation lies in personal involvement of top representatives of the supplier's company. Other, traditional manager tools and procedures cannot be successful in long-term conflict solution among overdesigned resource requirements. Today none of the projects can be said to be less important and has to give away its requiremets to leave the space for more important projects. In the majority of cases several parallel projects are nevertheless by the same sponsor – the customer. Consequently the suppression of the realization of some of them will cause problem with the same customer anyway, he will overlook our success

in the case of the most important project because we have endangered his interests and plans in other part of his projects.

At the same time the suppression of "secondary" projects into the level of export of the work to the cooperation with external supplier sharply increases quality guarantee and stability of terms, it increases minimal linear costs for the provision of term and quality timeliness and from the economic point of view we export the money out of the company and do not utilize our own sources. In the final result it makes the results of the company worse which the project won in hard fights. As firms are administered and evaluated by the means of line management models, in the case of year evaluation this type of situation increases the pressure on the elimination of dominance of main projects at the expense of others because in the final accounting this way shows to be not very optimal from the point of view of results of own firm. It is only investment into the future because key projects create the base for the future periods and in the case of OEM producers they are nominations for the supply in the horizon of several years for given model, which we as a supplier successfully completed and we passed in the nomination of the supply of component parts for serial production.

6 MODEL FINALLY IMPLEMENTATION

The model has been developed and constructed in real conditions and environment of a system supplier to Automotive. Its construction involved more than 12 projects for four car producers as well as opinions and requirements of more than 20 project managers. The implementation itself consisted of analytical part of customer needs, analysis of project managers' needs, system possibilities, communication chanels with customers, degree of literacy of all people involved in the projects and integration possibilities of software tools.

The solution is under constant changes and optimalization, mostly integration of different customer systems and interface to their reporting tools. The result is a solution used in several automotive companies with different types of supplies for car producers.

6.1 Theoretical benefits

In my opinion, theoretical benefit is a detailed analysis of existing tools, honestly saying that none of existing and used tools is universal and able to accommodate and solve all requirements for project managers in present conditions. Many of the authors quoted have a similar opinion, describing the situation from a marginal view "rodeo" to a theory of chaos that should be used in the present project management world.

6.2 Practical Benefits

Practical benefit is a new combination of existing tools in project management into a different form, trying to create elastic structure able to absorb today's dynamic requirements of customers and project managers. The result of this solution is not a new software product. It is a new, unique software tool, formed by MS Project basic platforms and Sharepoint and many included models providing required elasticity and functionality. Analogy with existing platform and modularity of cars design and production is not a mere coincidence. This analogy sends a clear message and thus I do not consider the result of my work to be a coincidence. The concept of software tool on PM copies development and trends in existing car design.

6.3 Recommendations for Futher Research

My recommendations for further research and development in this area is definitely adaptability of new software tools. OEM producers dictate the supply chain methodology, quality of R&D, production and supplies with almost zero tolerance in process deviations. Present project management falls down in sufficient intuitive but system tools for suppliers and project managers. Project manager will not choose a tool because of functionality and integrity, but a tool that will enable him to finish the project in agreed varying deadlines and to reach success

7 CONCLUSION

Project management has as many different forms nowadays as documented by Changes management. This work discusses current status and solutions for effective project management in the group of interconnected supplier's factories within Automotive category TIER 1 under conditions of multi project atmosphere.

Complexity of a solution is given by parallel running of multiple projects for the same customer with different types of simultaneous supplies. It refers to existing supplies of design, cubing, CAD tools design based on digital models of parts, simulations of heat flow, forming, crash tests and voltage flow. Also design and production of stamping tools, technologies, deliveries of stamped and welded parts, deliveries of assembled or measuring devices and last but not least, deliveries of complex automated assembly lines, discrete workstations or conveyor belts and manipulation technique directly for OEM car producer assembly line.

Such a complex environment full of different projects running in parallel is a specification of its own, individual needs based on exact timing and allocation of appropriate resources. Under these circumstances, single-level solutions do not work to support the project, despite being useful in other situations. Different projects have different timings and a cycle of a continuous need of resources that cause changes mostly in customer deadlines. Customer requires very quick, guaranteed action in agreed time and is not willing to accept changes on supplier's side such as postponing fulfilling of requirements to several months. It would destroy previously established coordination of resources. If we count also number of unexpected changes and projects running in parallel, it seems to be - on face of it an irresolvable task.

As IT support to project managers, this is the main reason to repeatedly look for right solutions. Following fundamental changes at automotive market (producers or sellers) at the end of first decade of 21st century, well-organized IT world of systems, supporting project management, must have changed its focus and reorganize into a plastic form of integration, cooperation and adjustment of existing tools.

It is not that unusual, to have in a single project 12 000 rows of managing tasks, in MS Project. It is a piece of work for several months for hundreds of employees. Many discrete ongoing tasks are coordinated on a daily basis. Coordination meetings held also on daily basis control, coordinate and plan activities for coming hours and days, step by step. With such a volume of people involved and

tasks, it is necessary to use different tools in a long run on a daily basis. MS Excel serves as a fundamental base of project manager, monitoring basic lines of MS Project plan that covers kappa planning and milestone in deadlines and coordination. At the same time, deadlines of individual parts and groups are updated at least on a weekly basis at RPlan and hundreds of open tasks are monitored, reported, notified and agreed at Sharepoint.

This information data structure ends as a report of a predefined structure as received from the customer (Figure 9). Mostly PowerPoint presentations consisting of supplier statuses and customer standpoint. It is the top of a pyramid of information and statuses of several systems, updated on a daily, maximum weekly basis. There is no single information system that would be independent and provide a project manager necessary support, not requiring coordination and interaction with other systems. Kappa planning, the same as other systems, signals the need for non-existing sources if deadlines are to be met, but looking back, capacities were always met on time.

Nowadays the only solution and necessity is coordination and system interconnection of several required systems to different levels of data and process need of the pyramid. Data pumps between integrated systems provide us with updated statuses, tasks reports with degree of completion, planning tools signal the need for resources and the start of implementation, notification systems alert responsible employees with reminders of ongoing but also delayed tasks. Reporting tools collect all data and turn them into statuses allowing taking immediate decisions in real time.

Every group of employees involved in a project uses appropriate tool at its level and at the same time has to obtain information from lower level and reports results to a higher one. The goal of a solution and IT support is to keep updated not tools themselves, but their integration and data accuracy all the time. There is a space for proprietary solutions:

- online passive report of customer internal portal of suppliers *(Figure 24)*
- locally stored information
- MS Excel for monitoring of external cooperation supplies *(Figure 14)*
- milestone tracking in Master MS Project plan *(Figure 11)*
- reporting deadlines of individual component and tools phases *(Figure 13)*

and for a group of people involved into a project – Sharepoint notification system *(Figure 19, 20 and 21).*

Aggregated information are dominant for two key groups of receivers. Customers represent the first one. Information about meeting the deadlines and statuses of completed tasks are collected for their need. The second key group with a different report configuration is the group of shareholders. Their report consists of confirmed customer status and includes also resources disposal, status of estimated profitability of the project, unexpected problems and conflicts and future need of resources. This report is of the same importance as the first one and plays a big role in project support and necessary allocation of resources needed for its successful realization. Both reports must be regularly updated within a reasonable time by the project manager, with no delays, because it would cause neglection and inaccuracy and consequences could be fatal for further project development towards the customer but also within the company itself. This commitment and obligation must be taken over by IT support who will ensure a smooth flow of all required systems, communications and data integrity.

Accomplishment of required processes depends on cooperation between individual tools, strict separation of space for their operation, information matrix of data flow and sticking to the rules for regular and on-time updates. This is a way to create a flexible tool able to cope with a dynamic environment, adapt and process every single customer change, respect constancy of resources capacity and most of all a phenomenon of this era in project management concerning support tools – real time, accuracy of presented data and ability of early prediction of conflicts towards the customer.

Solution described and analyzed further is a unique system integration of generally used tools (Figure 17), completion of these tools with internal native integration of MS Project Pro into Sharepoint, online monitoring of RPlan portal statuses of the customer and established Sharepoint notification system that communicates interactively with employees through their native environment of MS Outlook.

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9   APPENDIX

1. Survey beetween project managers

2. Table of project management tools

3. CD with results in survey

Appendix 1

Survey between project managers (original slovakian)

Professional MBA
Automotive Industry

TU WIEN > CONTINUING EDUCATION CENTER

:::: S T U

Survey beetween project managers.

Pri riadení projektu Vás najviac zamestnáva :
- ☐ Dodržanie termínov projektu
- ☐ Dosiahnutie požadovanej kvality
- ☐ Organizácia vlastného tímu
- ☐ Zmena požiadaviek a termínov zákazníka v priebehu projektu

Reportovanie a údržba dát aktuálneho stavu projektu v systéme zákazníka :
- ☐ Je žiadúce, lebo štandardizuje komunikačný jazyk a fakty stavu projektu
- ☐ Je prospešné , lebo je zároveň aj interným systémom na sledovanie a riadenie projektu
- ☐ Je to duplicitná / triplicitná práca a viaže zbytočne zdroje na strane dodávateľa

Zákazník požaduje reportovať stav projektu v :
- ☐ Iba email
- ☐ Iba zápisy z projektových stretnutí
- ☐ Excel
- ☐ MS Project
- ☐ SAP
- ☐ R Plan
- ☐ Enovia
- ☐ Team Center
- ☐ Iný (uveďte prosím aký) _____

Aktuálny projekt riadite interne v prostredí :
- ☐ V prostredí zákazníka
- ☐ Iba email
- ☐ Iba zápisy z projektových stretnutí
- ☐ Excel
- ☐ MS Project
- ☐ SAP
- ☐ R Plan
- ☐ Enovia
- ☐ Team Center
- ☐ Iný (uveďte prosím aký) _____

Za všeobecne najpoužívanejší nástroj na riadenie a reportovanie projektu považujete :
- ☐ uveďte prosím aký : _____

Za najlepší zo všetkých Vám známych považujete :
- ☐ uveďte prosím aký : _____

Prosím zaškrtnite vždy iba jednu možnosť   Survey PM, ID 1227688, Aug, 2014   Ďakujem

Appendix 1

Survey between project managers (English)

Professional MBA
Automotive Industry

TU WIEN ::::: STU

Survey beetween project managers.

By leading a project , takes the most of your time :
- ☐ Observance of project deadlines
- ☐ To achieve required quality
- ☐ Organisation of your team
- ☐ Change on customer's demands and dates within a project

To report and keep data of project's actual condition in constumer's system :
- ☐ Is desirable, while it is standardizing komunication language and facts of project's condition
- ☐ Is helpful, while it is as well as internal system for observation and control project
- ☐ It is double/triple work and it unnecessarily bind sources on the providor side

Customer requires a repor of project's condiion in :
- ☐ Just e mail
- ☐ Only the enrolment from designing's meetings
- ☐ Excel
- ☐ MS Project
- ☐ SAP
- ☐ R Plan
- ☐ Enovia
- ☐ Team Center
- ☐ Other (please, state) _____

You are controlling your actual project :
- ☐ In coustumer's ambient
- ☐ Only e mail
- ☐ Only the enrolment from designing's meetings
- ☐ Excel
- ☐ MS Project
- ☐ SAP
- ☐ R Plan
- ☐ Enovia
- ☐ Team Center
- ☐ Other (please, state) _____

For generally most used tool to control and report project you consider as :
- ☐ Please state : _____

The best of all to you known you consider as :
- ☐ Please state : _____

Please, always check just one answer   Survey PM, ID 1227688, Aug, 2014   Thank you

Appendix 2

Table of project management tools[11]

Software	Collaborative software	Issue tracking system	Scheduling	Project Portfolio Management	Resource Management	Document Management	Workflow system	Reporting and Analyses
10,000ft	Yes	No	Yes	Yes	Yes	No	Yes	Yes
2-plan	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
24SevenOffice	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AceProject	Yes	No	Yes	No	Yes	Yes	No	Yes
Anyplan	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Apache Bloodhound	Yes	Yes	No	No	No	No	Yes	No
Assembla	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AtTask	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Axosoft	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Basecamp	Yes	No	No	No	Yes	Yes	No	No
Binfire	Yes	No	No	Yes	Yes	Yes	Yes	No
Bontq	Yes	Yes	Yes	Yes	No	Yes	No	No
Brightpod	Yes	No	Yes	Yes	No	Yes	Yes	Yes
BrightWork	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Calligra Plan	No	No	Yes	No	Yes	No	No	No
Ceiton workflow system	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Celoxis	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Central Desktop	Yes	Yes	No	No	No	Yes	No	No
Clarizen	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ClickHome	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Collabtive	Yes	No	No	No	No	Yes	No	Yes
Compuware Changepoint	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ConceptDraw Project	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Concerto Projects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Contactizer	Yes	No	No	No	Yes	No	No	No
Copper Project	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Deltek Open Plan	Yes	No	Yes	Yes	Yes	No	No	Yes

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[11] *http://en.wikipedia.org/wiki/Comparison_of_project_management_software*

Software	Collaborative software	Issue tracking system	Scheduling	Project Portfolio Management	Resource Management	Document Management	Workflow system	Reporting and Analyses
Deltek WelcomHome	Yes	Yes	No	Yes	No	Yes	Yes	Yes
DeskAway	Yes	Yes	Yes	No	Yes	Yes	No	No
Doolphy	Yes	No	Yes	Yes	Yes	Yes	No	Yes
dotProject	Yes	Yes	No	Yes	Yes	Yes	No	Yes
DynaRoad	No	No	Yes	No	Yes	No	Yes	Yes
Easy projects	Yes	Yes	Yes	Yes	Yes	No	No	Yes
Eclipse PPM software	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
eGroupWare	Yes	Yes	No	Yes	Yes	Yes	No	No
Endeavour Software Project Management	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
enQuire	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
eXo Platform	Yes	No	No	No	No	Yes	Yes	Yes
Eylean Board	Yes	No	Yes	Yes	Yes	No	Yes	Yes
FastTrack Schedule	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Feng Office Community Edition	Yes	No	Yes	Yes	No	Yes	No	No
FinancialForce.com	No	No	Yes	No	Yes	No	No	Yes
FogBugz	Yes	Yes	Yes	No	Yes	No	Yes	Yes
FusionForge	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Ganttic	Yes	No	Yes	Yes	Yes	No	No	No
GanttProject	No	No	Yes	No	Yes	No	No	No
Genius Project	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Goodwerp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
GroveSite	Yes	Yes	Yes	Yes	No	Yes	No	No
Hall.com	Yes	No	No	No	Yes	Yes	No	No
HP Project & Portfolio Software	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Huddle	Yes	No	No	No	No	Yes	No	No
Hyperoffice	Yes	No	No	No	No	Yes	No	No
iManageProject	Yes	No	No	No	Yes	Yes	No	No
in-Step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
InLoox	Yes	Yes	Yes	No	Yes	Yes	No	Yes

Software	Collaborative software	Issue tracking system	Scheduling	Project Portfolio Management	Resource Management	Document Management	Workflow system	Reporting and Analyses
JIRA	Yes	Yes	Yes	No	No	No	Yes	Yes
Journyx	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Kayako helpdesk software	Yes	Yes	No	No	No	Yes	No	No
Launchpad	Yes	Yes	No	Yes	No	No	No	No
LibrePlan	Yes	No	Yes	No	Yes	No	No	Yes
LiquidPlanner	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LisaProject	No	No	Yes	No	Yes	No	No	No
MacProject	No	No	Yes	No	Yes	No	No	No
MantisBT	No	Yes	No	No	No	No	No	No
MatchWare MindView 5 Business Edition	Yes	No	Yes	Yes	Yes	Yes	No	No
Mavenlink	Yes	No	Yes	Yes	Yes	Yes	No	No
Merlin	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Microsoft Dynamics AX	Yes	No	Yes	No	Yes	Yes	Yes	Yes
Microsoft Office Project Server	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Microsoft Project	No	No	Yes	No	Yes	No	No	Yes
Microsoft SharePoint Server	Yes	Yes	Yes	No	No	Yes	Yes	No
Microsoft Team Foundation Server	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Milestones Professional	No	Yes	Yes	No	No	Yes	No	No
MindGenius	Yes	No	Yes	No	Yes	No	No	No
MyWorkPLAN	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Métier	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NetPoint	No	No	Yes	No	Yes	No	No	No
NetSuite	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
O3Spaces	Yes	No	No	No	No	Yes	No	No
Odoo	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OmniPlan	Yes	No	Yes	No	Yes	No	No	Yes
OnePager Pro	Yes	No	Yes	Yes	Yes	Yes	No	Yes

Software	Collaborative software	Issue tracking system	Scheduling	Project Portfolio Management	Resource Management	Document Management	Workflow system	Reporting and Analyses
Onepoint Project	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Open Workbench	No	No	Yes	No	Yes	No	No	No
OpenProj	No	No	Yes	No	Yes	No	No	No
OpenProject	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Oracle Primavera EPPM (Primavera P6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
phpGroupWare	Yes	Yes	No	N/A	Yes	Yes	No	No
PHProjekt	Yes	Yes	Yes	No	No	No	No	No
Pivotal Tracker	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Planbox	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Plandora	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Planisware	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Planner Suite	No	No	Yes	Yes	Yes	Yes	No	No
PLANTA Project	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Project KickStart	No	No	Yes	No	Yes	Yes	Yes	Yes
Project Team Builder	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Project-Open	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Project.net	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ProjectLink	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ProjectManager.com	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Projector PSA	No	No	Yes	No	Yes	Yes	Yes	Yes
Projectplace	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Projecturf	Yes	Yes	Yes	Yes	Yes	Yes	No	No
ProjektronBCS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ProjeQtOr	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proliance	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Prolog	Yes	Yes	No	Yes	No	Yes	Yes	Yes
QuickBase	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RationalPlan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Realisor	Yes	No	Yes	Yes	Yes	No	No	Yes
Redbooth	Yes[5]	Unknown	Unknown	Yes	Yes	Yes	Unknown	Unknown
Redmine	Yes	Yes	Yes	Yes	No	Yes	Yes	No

Software	Collaborative software	Issue tracking system	Scheduling	Project Portfolio Management	Resource Management	Document Management	Workflow system	Reporting and Analyses
SAP Business ByDesign	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sciforma	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Severa	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Smartsheet	Yes	Yes	No	No	Yes	Yes	No	Yes
TACTIC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Talygen	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
TargetProcess	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
TaskJuggler	Yes	No	Yes	No	Yes	No	No	No
Teamcenter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TeamDynamixHE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TeamLab	Yes	No	Yes	Yes	No	Yes	No	Yes
Tenrox	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TestTrack	Yes	Yes	No	No	No	No	Yes	Yes
The Bug Genie	Yes	Yes	No	Yes	No	No	Yes	Yes
Tom's Planner	Yes	No	Yes	No	No	No	No	No
Trac	Yes	Yes	No	No	No	No	Yes	No
TrackerSuite.Net	Yes	Yes	Yes	Yes	Yes	es	Yes	Yes
Traction TeamPage	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Trello	Yes	N/A	N/A	N/A	N/A	No	N/A	N/A
Twproject	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ubidesk	Yes	Yes	Yes	No	No	Yes	No	No
web2project	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Workgroups DaVinci	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WorkPLAN Enterprise	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
workspace.com	Yes	Yes	Yes	Yes	Yes	Yes	Unknown	Unknown
Wrike	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zoho Projects	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

Figure 2 – Table of project management tools

Source : http://en.wikipedia.org/wiki/Comparison_of_project_management_software