

Informacijska podpora pospeševanju postopkov (projektov)

The Acceleration of Processes (Projects) Through Information Technology Support

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V zadnjem desetletju je očiten izredno velik poudarek podjetij za izboljševanje postopkov. V ta namen so se začele uporabljati tudi nove tehnike, predvsem na področju vodenja in informacijske podpore postopkov. Članek v prvem delu prikazuje osnovne mehanizme vpliva informacijske podpore na hitrost postopkov, v drugem pa je prikazan primer takšne informacijske podpore podjetja Genis. Zaradi izredne raznolikosti postopkov in uporabnikov je nujno, da je takšno orodje prilagojeno posameznim kombinacijam. Le tako se namreč omogočijo učinkovite in hitre posege. Rešitev že uspešno uporablja več slovenskih podjetij.

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(Ključne besede: zahteve tržne, projektno vodenje, podpora informacijska, okolje večopravilno)

Over the last decade there has been a lot of emphasis on process improvement by introducing new management techniques and informational support. In the first part this paper presents the basic mechanisms that affect the speed of processes. In the second part an example of a practical implementation of information technology (IT) application created by Genis is given. Due to the wide variety of processes and users the tool has to have the ability to adapt to the different processes and the different stakeholders in order to allow effective and rapid actions. This solution has been successfully implemented in a number of Slovenian companies.

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(Keywords: time-to-market, project management, informational support, multi-task environment)

0 UVOD

Ko govorimo o nekem postopku ali projektu kot posebni obliki postopka (npr. uvajanje novega izdelka), potem le-tega lahko razdelimo v več vzporednih postopkov:

- osnovni postopki:
 - postopki izdelka
- podporni (pomožni) postopki so:
 - organizacijski postopki (postopek izdelka mora biti podprt z določenimi dejavnostmi na področju organizacije, ki pa so lahko zelo različne v času postopka: enkrat so to bolj postopki v okviru delovnih skupin, drugič skupin, tretjič spet bolj postopki med funkcijskimi oddelki itn.;
 - informacijski postopki (zbiranje, distribucija, avtorizacija dokumentov, pregledovanje itn.)
 - kadrovske postopki (na različnih področjih se izvajajo različni postopki za doseg različnih rezultatov – vse to pa zahteva znanje)

Vsem tem postopkom lahko izmerimo hitrost. Za skrajšanje celotnega postopka je potrebno, da imajo vsi postopki vsaj podobno hitrost. Vodenje je izredno pomembno pri obvladovanju podpornih postopkov, saj ima lahko izjemen vpliv na hitrost

0 INTRODUCTION

When a process or project, e.g. the process of launching a new product, is analyzed it can be divided into several simultaneous processes:

- the basic process:
 - product process
- the supporting processes:
 - the organizational process (the product process has to be supported by organizational activities that might change during the process: workgroups, project teams, functional departments, etc.)
 - the informational process (collecting, distributing, authorizing of documents, reviews, etc.)
 - the human-resource process (at different stages different people are performing different activities in order to achieve different results)

All these processes can be characterized by their speed. In order to shorten the time of the complete process it is desirable that all the processes have a similar speed, at least to the extent that this is possible. From the management point of view, special

osnovnega postopka: npr. uvajanje novega izdelka. V primeru, da podporni postopki tečejo hitreje kakor osnovni postopek, lahko pričakujemo pospešitev tudi glavnega postopka. Pa tudi nasprotno, če imajo podporni postopki manjšo hitrost od osnovnega, se bo hitrost osnovnega postopka prav gotovo zmanjšala.

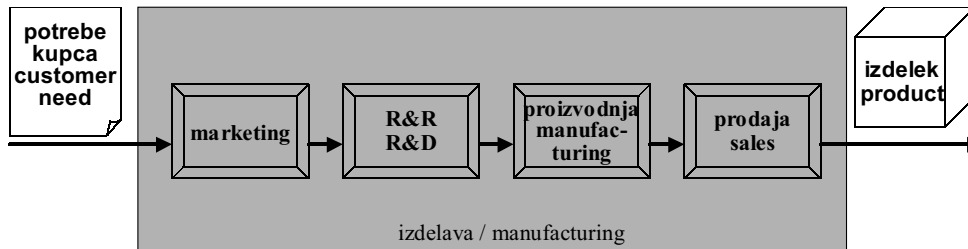
To lahko prikažemo s praktičnim primerom. Skupina, katere naloga je uvesti na trg nov izdelek, ima lahko odlične posameznike z veliko strokovnega znanja, toda zaradi neprilagodljive ali neprimerne organizacije dela, pomanjkanja komunikacije in neustrezne sestave skupine (glede na trenutne dejavnosti), se bo hitrost osnovnega postopka (uvedbe izdelka) zmanjšala (kljub temu, da so postavljeni vsi pogoji za nemoten potek osnovnega postopka: oprema, strokovno znanje itn.) [1].

1 MEDSEBOJNI VPLIVI POSTOPKOV

Postopek izdelka se začne z definicijo želja kupca in se konča, ko je izdelek ponujen (prodan) kupcu. Znotraj postopka se običajno pojavljajo različne funkcije (sl. 1).

Ta postopek običajno popišemo s karakteristikami postopka izdelka, npr.:

- čas za dokončanje razvoja (do izdelave kosovnice),
- čas do vpeljave izdelka v serijsko proizvodnjo
- itn.



Sl. 1. Splošen primer postopka izdelka
Fig. 1. A common example of a product process

Toda ta postopek (izdelka) se izvaja hkrati z informacijskim postopkom (ki obsega tok informacij skozi trženje, razvoj, proizvodnjo in prodajo), ki vsebuje: poročila, zapisnike, analize, predpise, pogodbe, zamisli itn.

Lahko ugotovimo, da sta oba postopka tesno povezana in medsebojno odvisna. Glavni cilj obeh postopkov je omogočiti kar najhitrejšo uvedbo izdelka na trg [2].

Za pospešitev postopka izdelka lahko uporabimo običajne metode: povečanje virov (kadrov, denarja), uporabo novih orodij za razvoj itn. Problem je v tem, da so ti ukrepi običajno zelo lokalni in zato se nagibajo k ustvarjanju lokalnih optimumov in s tem tudi ozkih grl.

Alternativno lahko uporabimo tudi popolno projektno organizacijo. Toda podjetja po navadi nimajo

attention has to be given to supporting processes that can have great influence on the speed of the main process, e.g. launching a new product. In the case that supporting processes are performed at a greater speed than the basic process, the speed of the basic process can increase. Conversely, if the supporting processes have a lower speed than the basic process, the speed of the basic process will definitely decrease.

This can be illustrated with a practical example. The team that has to launch a new product can have great professional knowledge, however, due to inflexible or inadequate organization, lack of communications and inappropriate composition for current tasks, the speed of the main process (product launching) will be decreased [1].

1 THE PROCESS INTERACTION

The product process starts with customer needs and ends when the product is offered to the customer. The process usually includes several functions (see Figure 1).

This process is usually characterized only by the product's process characteristics, for example:

- time to finish R&D (to build the bill of material),
- time to introduce the product into serial production,
- others.

However, this process is performed simultaneously with the informational process (the flow of information through marketing, R&D, manufacturing and sales), which consists of the following: reports, memos, analysis, orders, contracts, ideas, etc.

Both processes are closely linked and interdependent; the main purpose of both processes is to enable a quick product launch [2].

To speed up the product process, conventional methods can be used: increasing resources, using new design tools, etc. However, these measures are usually very localized and therefore inclined to increase bottlenecks.

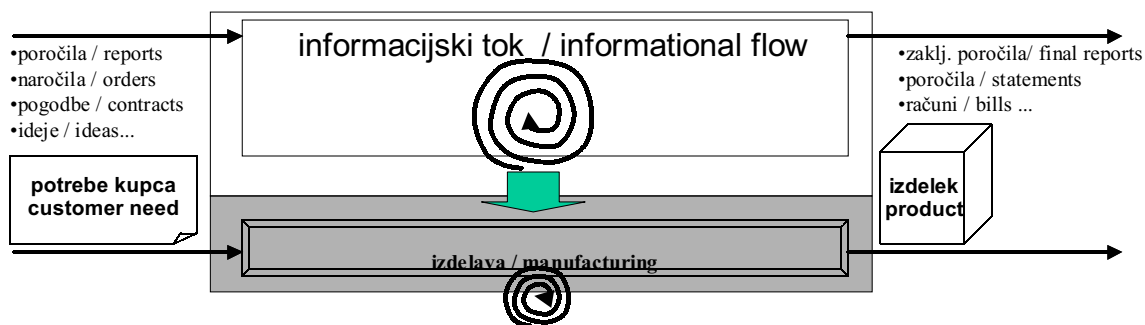
Alternatively, a planned organization can be used. However, companies do not always have the possibility to allocate people to the project for 100%

dovolj zaposlenih, da bi te lahko 100-odstotno razporedili na projekt. Toda če ljudje, ki delajo pri projektu, ne bodo tesno povezani in nameščeni, bo bistveno premajhna komunikacija in koordinacija (v okviru organizacijskega postopka). Rezultat bo počasnejši organizacijski postopek, ki lahko celo zmanjša hitrost informacijskega toka in postopka izdelka.

V tem primeru postane pospešitev informacijskega toka še posebej pomembna in zelo močno orodje, ki omogoči pospešitev celotne izdelave.

of the time. If people working on a project are not closely linked and located the organizational processes will suffer from a lack of communication and coordination. The outcome will be slower organizational processes that can decrease the speed of the informational flow and the product process.

In this instance the acceleration of informational flow becomes especially important and a very powerful way of accelerating the entire product process.



Sl. 2. Medsebojno vplivanje med informacijskim postopkom in izdelavo
Fig. 2. Interaction between informational and manufacturing

V ta namen lahko uporabimo moderna informacijska orodja (posebno tista, ki podpirajo delo z dokumenti), ki slonijo na tehnikah modernega vodenja. Z njimi lahko podpremo celoten postopek, od potreb trga do tega, da je določen izdelek ponujen trgu v okolju, kjer poteka več takšnih nalog.

To achieve this modern info-tools (especially those that are supporting document management) based on manufacturing management techniques can be implemented in order to support the complete process from the customer needs until the product is offered to the customer in a multi-task environment.

2 LASTNOSTI INFORMACIJSKEGA POSTOPKA

Potek podpornih postopkov je odvisen od panoge (gradbeništvo, elektroidustrija, storitve) kakor tudi od obsega (kratke naloge, velik projekt). Vendar pa je osnovni potek (ogrodje) enak za vse. Postopek se vedno začne z inicializacijo ali pa odločitvijo, s katero se potrди ideja o izdelku. Inicializaciji sledi načrt, v katerem se napove vse glavne lastnosti postopka (časovni okvir, viri, cilj). V fazi izvedbe se izdelava končni izdelek. Temu sledi postopek končevanja (sklepno poročilo).

Da bi zagotovili čim bolj učinkovito vključevanje različnih udeležencev v postopku, je treba informacijski tok razčleniti glede na tri največje skupine uporabnikov:

2 THE ATTRIBUTES OF THE INFORMATIONAL PROCESS

The supported process-flow depends on the nature of the branch (construction, electronics, services,...) as well as on its comprehensiveness (short task, greater project,...). Nevertheless, the basic process-flow is the same for all of them. The process always starts as an initialization process or a decision where the idea of launching a product is accepted. Initialization is followed by a plan, where all the main attributes of the process are predicted (time limit, resources, scope). In the realization phase the end product is produced out, while at the end the closing processes have to be performed (closing report,...).

To enable the contribution of the different stakeholders who are involved in this process to be as effective as possible the informational flow has to be segmented according to the three main stakeholder groups:



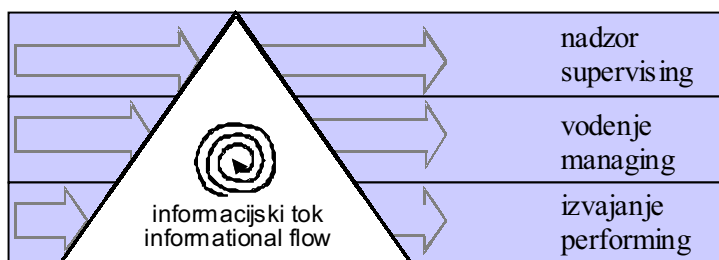
Sl. 3. Osnovni potek (ogrodje) postopka (projekta) [3]
Fig. 3. The basic process (project) [3]

- nadzorna raven
- vodstvena raven
- izvajalska raven

Te tri skupine imajo bistveno različne medsebojne interese. Da bi bil njihov prispevek k postopku izdelka čim večji, jim mora informacijski postopek ponuditi izbrane informacije (in ne kar vseh) o stroških, tehničnih risbah itn. glede na raven [4]. Posamezna skupina ali udeleženec mora biti tudi selektivno vključen v sam postopek (kot podpisnik, avtor dokumenta itn.).

- the supervisory level
- the managing level
- the performing level

These three groups have significantly different interests. In order to support their activities in the product process the informational process has to give them selected information (about the costs, technical drawings, etc.) according to the level, and they have to be selectively involved in the process (as a signer, document author, etc.) [4].



Sl. 4. Razčlenitev informacijskega toka
Fig. 4. The segmentation of informational flow

Na nadzorni ravni se večinoma izvajajo odobritve ter prikazujejo periodični podatki o rokih, stroških in trenutnih rezultatih.

Na vodstveni ravni se ne izvajajo samo odobritve, ampak tudi ustvarjajo dokumenti različnih tipov (začeni s načrtom) in poročila. Prikazujejo pa se predvsem podatki o: natančnejši opredelitvi rokov, stroškov in trenutnih rezultatih (ustvarjajo se dokumenti in poročila, zapiski o problemih, ki so se pojavili itn.).

Na izvajalski ravni se predvsem izdelujejo različni tipi dokumentov in poročil. Za to raven je potrebno prikazovanje podatkov o rokih, stroških in ciljih za posamezno dejavnost, v katero je posamezen izvajalec vključen, pa tudi vpogled v rezultate (dokumente) drugih sodelavcev, ki delajo na istem projektu.

Podatki morajo biti dostopni v eni minuti, morajo imeti jasno izkaznost (kdo jih je ustvaril, kdaj). To velja za vse uporabnike hkrati.

Če bodo vse te zahteve izpolnjene, bo informacijski postopek pospešil izvedbo postopka izdelka [3].

On the supervisory level it is mainly the approvals that are performed and the common periodical data concerning time limits, costs and present results that have to be delivered.

On the managing level it is not only the approvals but also the creation of different types of documents (starting with the plan) and reports that are performed. The data that have to be delivered to the managing level consist primarily of the following: detailed data about time limits, costs and present results (documents and reports created, problems that occurred).

On the performing level it is the creation of different types of documents and reports that is carried out. The requested data are composed of time limits costs and the results of activities in which the individual is involved as well as insight into the results (documents) of other participants.

The data have to be accessible within one minute and have to be unambiguous in their identity for all stakeholders at a certain time.

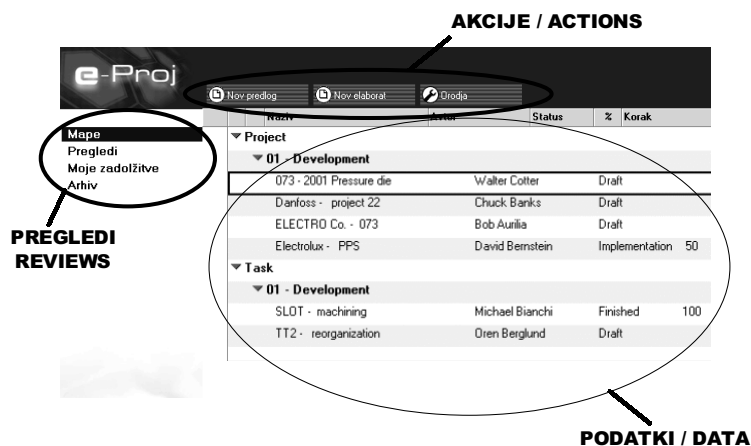
This can ensure that the informational process will accelerate the product process [3].

3 ZNAČILNOSTI PROGRAMA (E-PROJ)

Program v celoti podpira zgoraj opisan postopek od inicializacije do konca postopka tako, da deluje segmentno (glede na raven uporabnika) [6]. Ker program teče na serverju, jo lahko uporabljajo vsi uporabniki v podjetju, pa tudi zunaj njega, kar omogoča medmrežna verzija. Zaradi različnih ravni uporabnikov se tudi informacije podajajo v več ravneh z avtorizacijo vsake posamezne informacije (dokumenta) glede na raven uporabnika. Za vse uporabnike pa je vhod v program enak (sl. 5).

3 THE CHARACTERISTICS OF THE APPLICATION (E-PROJ)

The application completely supports the above-described process from initialization until the process is closed, in a segmentation approach [6]. As a result of a server installation the application can be used by all stakeholders in the company and also outside the company by using the Web version. Because of the different levels of the stakeholders the information is also multi-leveled and authorized according to the user's level. For all the stakeholders the entrance is identical (see Figure 5).



Sl. 5. Vstop v program e-Proj
Fig. 5. The entrance in the e-Proj application

Vstopno okolje sestoji iz:

- dejavnosti: kjer se prikažejo vse dejavnosti, ki jih trenutno lahko uporabljamo (tudi glede na avtorizacije),
- pregledov, kjer je mogoče različno pregledovanje podatkov o postopku (projektu), glede na interese uporabnikov
- podatkov, kjer se prikažejo izbrani podatki.

Vsak v podjetju lahko izdela nov predlog (za nalogo, projekt), toda postopek potrjevanja takšnega predloga je vnaprej določen (nastavljen od administratorja – glede na interne organizacijske predpise).

Pregledujemo lahko po mapah. Tako lahko pregledamo mapo posameznega postopka (projekta), ki vsebuje vse podatke o izbranem postopku (projektu). Primerjavo in pregled vseh postopkov (projektov) lahko izvedemo z uporabo “Pregledov”, kjer lahko v različnih postopkih pregledujemo podatke po nekem skupnem kriteriju – npr. dokumentaciji (pregledujemo določen tip dokumentacije v vseh postopkih/projektih). Glede na to, da smo v okolju, kjer hkrati teče več nalog in projektov, lahko posameznik najde vse dejavnosti, pri katerih nastopa v kakršnikoli vlogi, pod “Moje zadolžitve”. Ko je postopek končan, se celoten postopek (z vsemi podatki) shrani v arhivsko bazo.

V pregledih se prek vseh postopkov (projektov/nalog) v podjetju prikazujejo podatki glede na izbran kriterij. Vendar pa so vsi podatki prečiščeni glede na uporabnika (nadzornik, vodja, izvajalec) in njegovo vlogo v postopku (projektu) ter v podjetju. Zaradi tega je obseg prikazanih podatkov omejen in prirejen za posameznega uporabnika

4 PRIMER UPORABE PROGRAMA V ORODJARSTVU

Postopek izdelave (uvajanja) novega izdelka je vsakodnevni postopek v orodjarnah. Postopek od prvega stika s kupcem do plačila za celoten posel teče tako kakor je bilo nakazano na sliki 3 in ga

The entrance neighbourhood consists of:

- actions: where all currently possible actions (also according to the authorizations) are present
- reviews: where different ways of examining the process (project) data, according to the stakeholder interests, are possible
- data: where the selected data are shown

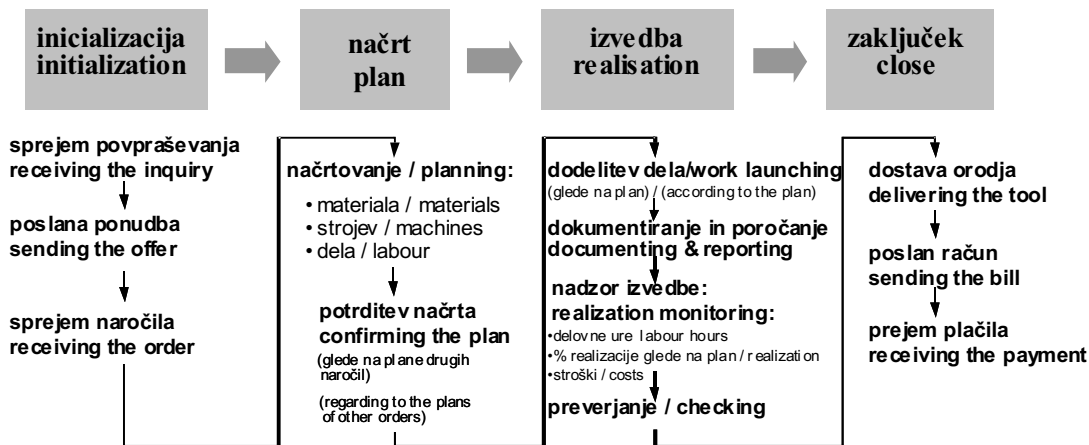
Everybody in the company can create a new proposal, however, the process of approval is fixed by the application (set up by the administrator according to the organizational regulations).

A review can be made by inspecting a map of a particular process (project). The map contains all the data about a particular process (project). The comparison and review of all processes (projects) can also be made through “Category” where different processes are listed according to their common criteria e.g.: documentation. All the tasks in a multi-project environment where a particular stakeholder has to be involved, can be found by this stakeholder as “My tasks”. When the process is closed the complete process (with all the data) is saved as an archive database.

The data are shown according to the criteria, selected in “Review” for all processes (projects) in the company, which enables complete support for a multi-process (project) environment. However, all the data are filtered according to the stakeholder profile (supervisor, manager, performer) and his role in the process (project) and in the company. Therefore, the range of information is limited and adapted to a particular stakeholder.

4 AN EXAMPLE OF AN APPLICATION IN A TOOL-MAKING COMPANY

The process of launching a new product is a daily process in a tool-making company. The process, from the first contact with the customer until the payment for the completed business, fits the basic



Sl. 6. Postopek dela v orodjarni
 Fig. 6. The process in a tool-making company

lahko podrobneje popišemo tako kakor prikazuje slika 6.

Udeleženci tega postopka so:

- kupec,
- vodstvo podjetja (ki določi ponudbo, potrdi načrt, preverja realizacijo in konča postopek/posel),
- vodstvo postopka / projekta, ki načrtuje, razdeljuje in koordinira delo, dokumentira in poroča, spremlja realizacijo, skrbi za dobavo orodja),
- izvajalci, ki izvedejo delo, poročajo o poteku dela, stroških in urah za posamezno dejavnost.

V začetni fazi vodstvo zbira podatke in dokumente z namenom, da bi podalo pravilno ponudbo. Lahko odpremo nov predlog (naloge / postopka / projekta) in vsi podatki (dokumenti) se lahko že začnejo zapisovati na ta predlog, skupaj z osnovnimi podatki o organizaciji postopka (kdo je kupec, kdo je imenovan za vodjo projekta, kdo bo sodeloval pri izvedbi projekta itn.) [7].

Če se je začetna faza končala uspešno, s prejetim naročilom, je treba izdelati podroben načrt [8]. To izvede projektna skupina na čelu s projektnim vodjem. V ta namen bo izdelalo precejšnje število dokumentov. Vse dokumente

process (see Fig 3), and can generally be described as shown in Fig 6.

The stakeholders in this process are:

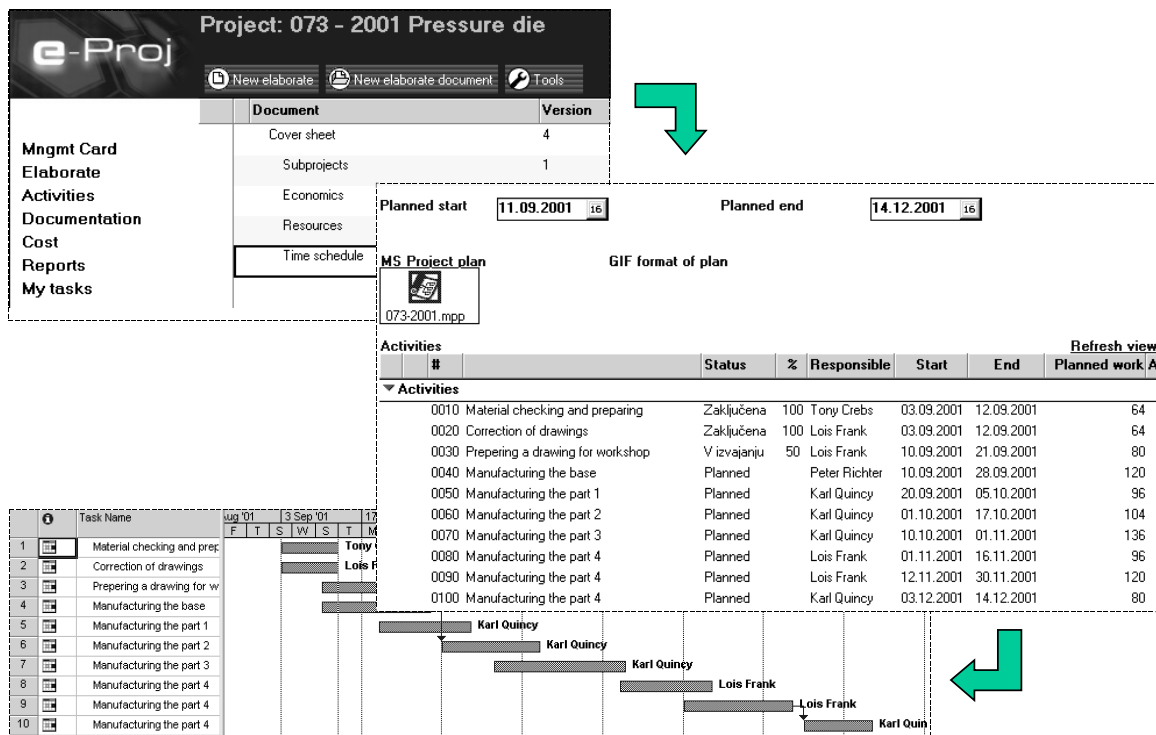
- the customer;
- the management of the company (which decides about the offer, confirms the plan, checks the realization and closes the process);
- the management of the process / project (which is planning, launching the work, documenting and reporting, monitoring the realization, taking care after tool delivery);
- the labour that is carrying out the planned job, reports about the job, costs and hours, used for particular activity.

In the initialization phase the management of the company collects data and documents in order to make a decision about the offer's requirements. A new proposal can be opened and all the data can be immediately entered together with the basic data about the process organization (who is the customer, who is declared as a project manager, who is anticipated to work on the project etc.) [7].

If the initialization phase is successfully closed with the accepted order, the final plan has to be created by the project team led by the project manager [8]. For this purpose a number of documents are created where all the documents can be saved on the project:

Basic data		Documents	
Code	073 - 2001	Ordered by	Electro Co.
Title	Pressure die	Supervisor	John Smith
Rank	Project	Leader	Walter Cotter
Type	01 - Development	Members	Bob Lucas Mark Johnson Danny Walton
Priority			
Purpose and objectives:			
The die is similar as the one from the job 023-2000 (see the drawings: [img], [img], [img]) It is estimated that due to repeated job app. 30% costs can be saved (therefor lower offer !!!).			
The last request was received on 01.08.2001 - see: Electro Co. - Request.doc For other documents see Tab "Documents"			

Sl. 7. Začetek postopka
 Fig. 7. Initialization of the process



Sl. 8. Načrtovanje projekta
Fig. 8. Planning of the project

lahko shranjujemo na projekt: načrt ur dela, načrt zasedenosti strojev, materialne potrebe, odobritve za delo izvedeno zunaj podjetja, risbe kupca, zapisniki, protokoli itn. Vsi zahtevani viri in predvideni rezultati morajo biti predstavljeni vodstvu, ki načrt potrdi.

V fazi realizacije je treba načrt izvesti. V tej fazi je posebno pozornost treba nameniti ujemanju med parametri načrta in izvedbe. Opravljeno delo, poraba materiala in zasedenost strojev – to so podatki, ki jih prek poročil poročajo izvajalci. Prav tako so na projekt zapisane vse spremembe pogodb, risb itn. Poleg tega se na projekt zapisujejo tudi vsi zapisniki, odločitve in drugi dokumenti. Vseskozi lahko vodstvo projekta spremlja spremembe parametrov, dokumentov itn. Če je treba, lahko takšen nadzor izvaja tudi vodstvo podjetja, ki pa projekt tako ali tako preverja na načrtovanih nadzornih točkah [9].

Ko je orodje izdelano, vodstvo projekta poskrbi za dostavo orodja kupcu in sklene projekt s poslanim računom in prejetim plačilom. Vsi dokumenti od računa do končnega poročila so shranjeni na projektu. Projekt je arhiviran, vendar so podatki uporabni tudi kasneje, predvsem kot baza znanja.

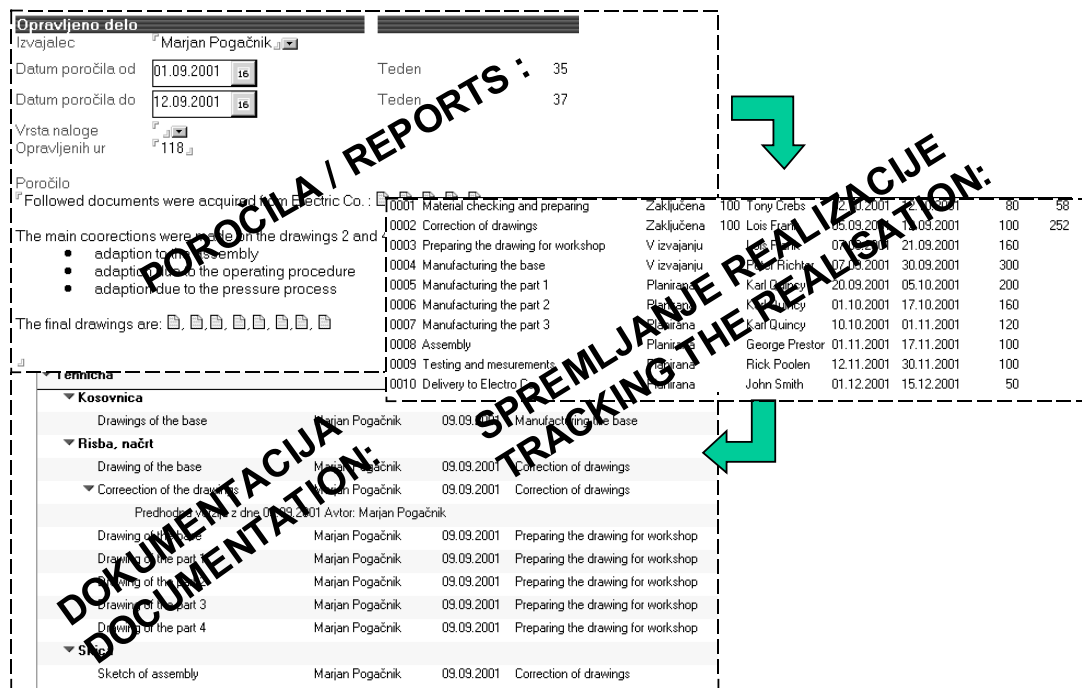
Program sili uporabnika, da izvede projekt glede na definiran načrt in osnovne parametre (cilje). Zaradi preglednosti, popolnosti informacij in prilagoditve uporabniku program tako pospešuje realizacijo, odločitve pa tudi akcije in ukrepe med

labour plan, machines plan, materials plan, agreements for the job performed outside the company, drawings from the customer, minutes, protocols, etc. All necessary resources and outcomes have to be completed and presented to the company management, which confirms the plan.

In the realization phase the plan is transformed into realization where special attention is given to the accordance between the parameters that are planned and those that are realized. The completed work, the material used and the machine occupation is reported by the operators via reports. Also, all the changes to the contracts, drawings, etc., have to be saved on the project. In addition to these documents, minutes, decisions and other documents related to the project can be inserted too. The deviation in these parameters is continuously observed by the project management. If required, such monitoring is also performed by the company management, which also monitors the project at checkpoints [9].

Once the tool is manufactured, the project management attends at the delivery of the tool to the customer and closes the project by sending the bill and receiving the payment. All the documents from the bill to the final report are saved on the project. Finally, the project is archived, however, the data are used to build the knowledge database.

The application forces the user to perform the project according to the defined plan and the initial parameters. Because of its transparency, complete information, and customization, it accelerates the realization, decisions as well as actions and measures



Sl. 9. Spremljanje izvedbe projekta
Fig. 9. Tracking the realization of the project

celotno izdelavo. Na ta način pospešuje celoten postopek (projekt).

during the product process, and therefore increases the speed of the process (project).

5 SKLEP

5 CONCLUSION

Osnovni postopek je vedno podprt z različnimi postopki, ki tečejo hkrati. Eden od njih je tudi informacijski postopek. Če ga podpremo s programom, ki pomembno pospeši informacijski postopek, bo to prineslo tudi pospešitev osnovnega postopka. Program, ki je bil predstavljen, je delo podjetja Genis in je bil razvit v sodelovanju z Iskraemeco, sedaj pa ga že uspešno uporabljajo v različnih podjetjih v Sloveniji. Podpira skupinsko delo, omogoča preglednost za vse avtorizirane uporabnike in sili uporabnike, da izvajajo zadane naloge glede na načrt, pripravljen v prvi fazi. Program je prirejen za vse ravni uporabnikov v podjetju od vodstva do izvajalcev.

The basic process is always supported by different simultaneous processes, one of them is the informational process. If the informational process is supported by the application, which significantly increases the speed of informational processes, the basic process will also accelerate. The application that was presented, was developed by Genis in cooperation with Iskraemeco and has been successfully implemented in a number of Slovenian companies. It supports teamwork, enables transparency for all authorized stakeholders, and forces the user to proceed according to the plan, prepared in the initial stage. It is designed for all user levels in the company from the top management to the shop-floor staff.

Uporaba sloni na informacijski podpori vodenja, ki kombinira nove tehnične možnosti in moderne tehnike vodenja, z namenom pospeševanja postopkov.

The application is based on informational management tools, which combine new technical solutions and modern management techniques in order to accelerate the processes.

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