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Ustvarjalnost in odločanje v velikih organizacijah

Creativity and Decision Making in Large-Sized Companies

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Izvajanja inovacij so v svetu zelo različna, kakor so različni gospodarski sistemi, za vse pa velja, da mora imeti proces uvajanja inovacij ključno vlogo. Na inovacijsko delo v okviru podjetja delujejo zunanji in notranji vplivi. Poti v prenovo izdelkov so različne. Manj tvegana je pot z odkupom pravic, izpeljava lastne inovacije pa tveganje močno poveča. Odločitev za eno ali drugo pot odločujoče vpliva na prihodnji razvoj in kakovost podjetja.

Ustvarjanje inovacijskih skupin, sestavljenih po določenih pravilih, navadno pomeni najuspešnejšo možnost za inovacijsko delo.

Approaches to innovation differ worldwide depending on the economic systems of different countries, yet for any country, the process of implementing innovations is a key issue. Innovative work within a company is affected by a number of internal and external factors. There are different approaches to innovation: risk is low in buying licences and much higher when the company decides to implement and realize its own innovation. Deciding on one or another approach is of crucial importance for the company's future development and quality.

Formation of innovative teams according to well-defined rules is one of the possible, usually most promising ways leading to successful innovative work.

0. UVOD

Inovacije so izredno pomembne za uspešnost industrije, gospodarstva in družbe kot celote. Po splošnem prepričanju se z inovacijami lahko ukvarja vsakdo, potreba po načrtnem uvajanju novih aktivnosti pa se pokaže, ko zaradi neučinkovitega reševanja problemov postane podjetje nekonkurenčno, začne zastajati in propadati.

Znan je diagram poteka snovanja, trženja in donosnosti izdelka (sl. 1). Iz diagrama lahko spremljamo pričakovano dobo trajanja izdelka, stroške njegovega razvoja, obdobje prodaje in dobička, oboje pa začne po določenem času upadati in nazadnje dobiček v celoti usahne. V obdobju upadanja dobička se vprašamo, kaj storiti, da bi negativne usmeritve zopet obrnili. V manjših podjetjih izdelek razmeroma hitro zamenjamo z novim, v večjih pa tega običajno ni mogoče storiti prek noči. Tukaj se pojavi vprašanje inovativnosti.

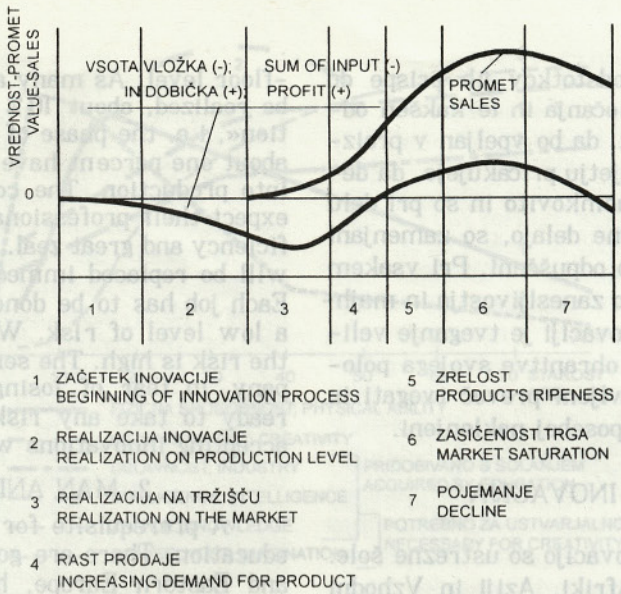
Načini reševanja teh vprašanj so v svetu različni, kakor so različna tudi gospodarstva. Razpon obsega področje od tržno usmerjenih, pa vse do načrtno določenih državnih gospodarstev. Za vse velja, da mora imeti proces uvajanja inovacij ključno vlogo. Negativen vpliv gospodarjenja države z velikimi podjetji, ki smo ga lahko v preteklosti zasledili tudi v razvitih evropskih državah, lahko opazimo še dandanes. V Avstriji jim še ni uspelo rešiti negativnih tokov v velikih državnih

0. INTRODUCTION

Innovations are highly relevant for the success of industry, the economy and society as a whole. It is generally believed that innovations can be anybody's concern, but a more careful approach to innovative activities becomes a necessity when a company starts losing the competitive edge and sinks into stagnation and decline due to inefficient solutions.

Let us consider the well-known diagram of product design, marketing and profitability of a product (fig. 1). The diagram shows within the product's design life, the costs of development and a period of sales and profit, which then both start declining after a certain period and the profit finally vanishes completely. In the period of profit decline, the company then start wondering what they should do to redirect the negative trends. In large companies the product cannot be replaced in a relatively short time. It is here that the question of innovativity arises.

Approaches to innovativity problems vary a great deal depending on the country's economic system. These systems range from countries with a market economy to those with state-planned economies. Irrespective of the economic system, the process of introducing innovations into industry must receive every consideration. The negative effects of the state economy in large-sized companies in the past can still be felt even in developed European countries. In Austria, for example, they have not been successful in stopping negative trends in large, state-owned companies,



Sl. 1. *Ciklus nastajanja izdelka*
Fig. 1. *Life cycle of product*

podjetjih, ki ne poslujejo zgledno in jih mora država finančno podpirati. Iz tega se lahko naučimo, da je proces urejanja podjetij dolgotrajen in je treba reševati probleme vztrajno in potrpežljivo.

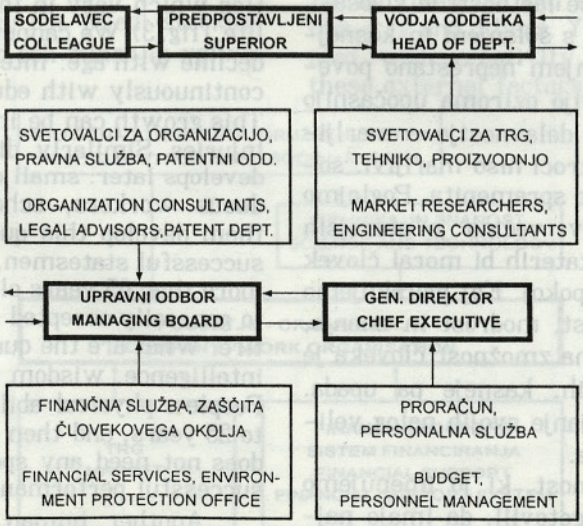
1. INOVACIJA IZDELKA

Oglejmo si proces inovacije izdelka v velikem podjetju in načelni zaporedni diagram poteka inovacije. Začnimo s primerom: delavec v podjetju ima določeno tehnično zamisel (sl. 2). Sporoči jo predpostavljenemu. Zamisel na tej ravni prvič naleti na ocenjevanje. Predpostavljeni pokaže zamisel vodji oddelka, ta pa se o vsem posvetuje s svojimi sodelavci. Zamisel nadaljuje svojo pot do članov upravnega odbora in glavnega direktorja. Vsaka postaja na določeni ravni pomeni oviro zamisli na poti do izdelave. Kar 90 odstotkov zamisli se nikoli

which are still not able to make profits and the state has to provide financial support. This shows that the process of restructuring is a long-term one, and its problems can be solved only with perserverance and patience.

1. PRODUCT INNOVATION

Let us see what the process of product innovation looks like and examine the features of the principal time diagram of the innovative process. Let us start with the example of a colleague in a company having a technical idea (fig. 2). He/she mentions their idea to their superior. Here the idea faces the first filtering and assessment. The superior presents the idea to the head of department, who asks for his colleagues' opinion. If successful, the idea is then transferred to the board of management and the chief executive. Each »station« on this way is a filter for the idea, and an obstacle to its progress and realization on the shop-



Sl. 2. *Pot obravnavanja in odločanja v veliki organizaciji*
Fig. 2. *A flowchart of decision making in large companies*

ne uresniči, približno 10 odstotkov jih prispe do končne postaje, do faze odločanja in le kakšen odstotek ima realno možnost, da bo vpeljan v proizvodnjo. Vodilni ljudje v podjetju pričakujejo, da delajo strokovnjaki izredno učinkovito in so pri delu požrtvovalni. Vsi, ki tako ne delajo, so zamenjani po hitrem postopku ali celo odpuščeni. Pri vsakem delu moramo delati z veliko zanesljivostjo in majhno stopnjo tveganja. Pri inovaciji je tveganje veliko. Predpostavljeni zaradi ohranitve svojega položaja v podjetju niso pripravljeni preveč tvegati in inovacijam tudi niso prav posebej naklonjeni.

2. ČLOVEK IN INOVACIJA

Prvi pogoj za dobro inovacijo so ustrezne šole. Dobre šole imajo tudi v Afriki, Aziji in Vzhodni Evropi, vendar večina inovacij prihaja iz Zahodne Evrope, Severne Amerike in dela Azije. Vsi drugi vidijo svojo prihodnost v licencah. Postavlja se vprašanje, zakaj izhajajo inovacije le iz tako omejenega in majhnega dela sveta.

Oglejmo si možen razvoj tehnične inovacije v domačem podjetju. Začnimo s pregledom, kakšne sodelavce imamo v podjetju. Navadno grešimo, če pri oceni sodelavcev nismo temeljiti. Pri tem ne smemo izhajati samo iz preteklih ocen delavca: dober študent ni nujno tudi dober konstrukter, dober pedagog ni vedno tudi dober inovator itn. Poučna je analogija z glasbeniki; vrhunski koncertant je predvsem izvajalec, ni pa tudi vrhunski komponist; velja pa tudi nasprotno. Kdo je potem dober oziroma boljši? Za tehnike pravimo le, da so dobri ali slabi, pri umetnikih pa znamo ločevati izvajalce od ustvarjalcev. Pri ustvarjalnem — inovativnem delu so torej potrebne še druge vrline. Človek ima različne lastnosti, ki se po razgibanosti in kakovosti spreminjajo vse življenje (sl. 3). Ne moremo reči, da se s starostjo vse lastnosti le slabšajo; inteligentnost se na primer s šolanjem in kasnejšim dopolnilnim izobraževanjem neprestano povečuje. Ta proces lahko ustavijo oziroma upočasnijo le bolezni in okvare. Tudi z delavnostjo — marljivostjo je nakaj podobnega: otroci niso marljivi, šola in kasneje zaposlitev pa to spremenita. Poglejmo starost uspešnih državnikov: večina je starejših od 65 let, to pa so leta, pri katerih bi moral človek po splošnih merilih oditi v pokoj. Kaj pričakujemo od državnikov: inteligentnost, modrost in znanje, ne pa velikih tveganj. Fizična zmožnost človeka je največja pri 20 do 25 letih, kasneje pa upada. Državnik za uspešno opravljanje svojih nalog velike fizične moči ne potrebuje.

Ljudje imajo tudi lastnost, ki jo imenujemo domiselnost. Psihologi so ugotovili, da imajo največjo domiselnost otroci pri šestih letih, vsako šolanje pa to lastnost sistematično zatira. Kaj pa

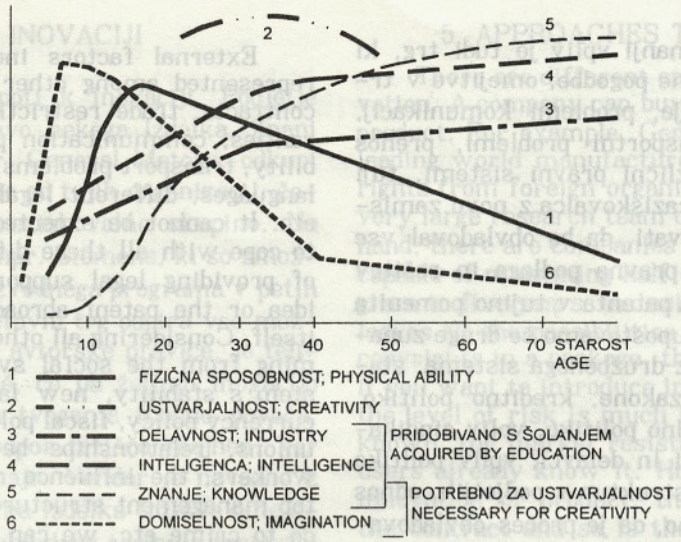
-floor level. As many as 90% of ideas will never be realized, about 10% will reach the »end station«, i.e. the phase of decision making, and only about one percent have a real chance of being put into production. The company's top management expect their professionals to work with high efficiency and great zeal. All those who do not do so will be replaced immediately, or even dismissed. Each job has to be done with high reliability and a low level of risk. With innovations, however, the risk is high. The senior management of a company, in fear of losing their positions, are not ready to take any risk and are not inclined to accepting innovations with enthusiasm.

2. MAN AND INNOVATION

A prerequisite for a good innovation is good education. There are good schools in Africa, Asia and Eastern Europe, however most innovations come from Western Europe, North America and part of Asia. All the other countries see their future in buying licences. The question arises as to why innovations come only come from this relatively small part of the world.

Let us examine a possible course of a technical innovation process in a domestic company. The process starts by assessing the qualifications of possible future members of the innovative team. Our first mistake is that we usually fail to make a thorough assessment of their qualities. To proceed simply from their past qualifications is not enough - a good student is not necessarily a good designer, a good teacher is not necessarily a good innovator, etc. Here an analogy to musicians might be instructive: a famous concert player is an excellent performer but usually not an excellent composer, and vice versa. Who is then good or better? Speaking of engineers, we say that they are either good or bad, but when speaking of artists we are aware of the distinction between performers and creators. In creative - innovative work there seem to be also other qualities that should be considered. A person is endowed with many qualities which vary in intensity in the course of his life, (fig. 3). We cannot say that all people's qualities decline with age: intelligence, for example, grows continuously with education and further training. This growth can be interrupted only by disease or injuries. Similarly, diligence is also a quality that develops later: small children are not usually assiduous workers, school and employment makes them develop this quality. Examining the age of successful statesmen, we see that they are mostly more than 65 years old, an age at which according to generally accepted criteria, a person should retire. What are the qualities expected of statesmen: intelligence, wisdom and knowledge, and no risk. People's physical abilities are highest at from 20 to 25 years, and then start declining. A statesman does not need any special physical power for the successful performance of his tasks.

Another human quality that is important for innovation is imagination. Psychologists have established that child possesses the richest



Sl. 3. *Človekove lastnosti v odvisnosti od starosti*
Fig. 3. *Man's abilities as a function of age*

ustvarjalnost? Ustvarjalnost je predvsem povezava znanja in delavnosti. Domiselnost in ustvarjalnost sta dve lastnosti, ki se časovno v življenjski dobi človeka ne ujemata. Ljudje so najbolj ustvarjalni med 20. in 40. letom starosti. Takrat imajo že precej znanja, domiselnost pa jim je šolanje že močno prizadelo.

Pri snovanju ekip za inovacijsko delo moramo zelo dobro poznati različne lastnosti delavcev in vedeti, kako bomo najučinkoviteje izrabili njihove dobre lastnosti, da bomo prišli do želenega cilja.

3. ZUNANJI VPLIVI

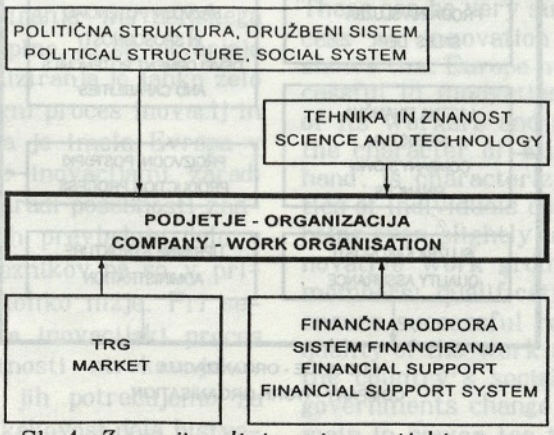
Na inovacijsko delo v okviru večjega podjetja delujejo tudi zunanji vplivi, ki jih moramo poznati in upoštevati (sl. 4). Na uspešnost inovacijskega dela vsekakor vplivata tudi politična struktura in družbeni sistem države, tj. med drugim sistem izobraževanja, davčna, finančna in raziskovalna politika, podpora gospodarstvu itn. Mladi strokovnjaki z veliko ustvarjalnostjo teh zunanjih vplivov navadno ne poznajo.

imagination at the age of six and all later education suppresses it systematically. What about creativity? Creativity is above all a combination of knowledge and industry. Imagination and creativity are two attributes that do not coincide in the course of our life. People are most creative between the age of 20 to 40. By that time, they have acquired a great deal of knowledge but their imagination is in a state already badly damaged by schooling.

In forming groups for innovative work, we have to be very well acquainted with each member's abilities and know how to take full advantage of their qualities, to achieve the stated objective.

3. EXTERNAL FACTORS

Innovative work in large companies is also affected by external factors, which have to be known and considered, (fig. 4). Successful innovative work is first of all dependent on the country's political structure and social system, characterized among others by the country's education system, fiscal, financial and economic policy, support to industry and others. Young researchers overwhelmed with creativity are not usually aware of these external factors.



Sl. 4. *Zunanji vplivi na inovacijski proces*
Fig. 4. *External influences on innovative process*

navadno ne poznajo. Zunanji vpliv je tudi trg, ki ga označujejo mednarodne pogodbe, omejitve v trgovini, izvozne garancije, problemi komunikacij, stabilnost valute, transportni problemi, prenos denarja, tuji jeziki, različni pravni sistemi, tuji zakoni itn. Od mladega raziskovalca z novo zamislijo ne moremo pričakovati, da bo obvladoval vse te dejavnike. Že samo pravna podlaga in rešitev prenosa zamisli oziroma patenta v tujino pomenita zapleteno nalogo. Če pa upoštevamo še druge zunanje vplive, ki izvirajo iz družbenega sistema: stabilnost sistema, nove zakone, kreditno politiko, devizno, davčno in socialno politiko, vpliv sindikatov, odnose med lastniki in delavci, vpliv politike na kadrovanje vodilnih struktur v podjetjih, odnos do kriminala itn., vidimo, da je proces obvladovanja celotne inovacijske verige zelo zamotan.

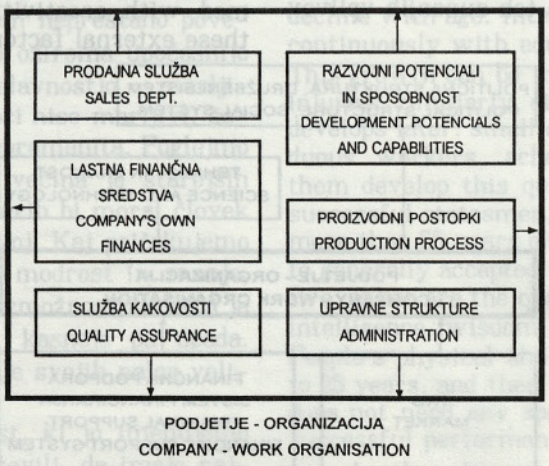
4. NOTRANJI VPLIVI

Povrnimo se v podjetje. Podjetje ima svoje proizvodne postopke, lastna finančna sredstva, svojo upravo, svojo prodajno službo, svoje razvojne potenciale, svojo službo kakovosti. To so za inovacije notranji vplivni dejavniki (sl. 5). Vse to je treba vključiti v sistem razvoja in uporabe inovacij, da jih bo podjetje resnično koristno uporabilo. Navedimo nekaj bistvenih elementov, ki sestavljajo proizvodni postopek: izkušnje z obdelavo materialov, izkušnje pri natančnosti obdelave in z organizacijo proizvodnje, urbanistično komunalno opremo, proizvodno opremo, strokovnostjo sodelavcev, nabavo surovin, s proizvodnimi kapacitetami, z zaščito okolja, s stroški proizvodnje, socialno zakonodajo — socialni mir. Postavlja se vprašanje, kako priti do inovacije čimbolj preprosto, ki terja odgovor, ali je v danem trenutku v podjetju izvedba inovacije sploh mogoča.

External factors include also the market, represented among other things by international contracts, trade restrictions, export trade warranties, communication problems, currency stability, transport problems, money transfer, foreign languages, different legal systems, foreign laws etc. It cannot be expected of a young researcher to cope with all these difficulties. Even the task of providing legal support and transferring the idea or the patent abroad is complex enough in itself. Considering all other external factors stemming from the social system, such as the system's stability, new laws, credit policy, hard currency policy, fiscal policy, welfare policy, trade unions, relationships between the owner and workers, the influence of politics in appointing top management structures in companies, attitude to crime etc. we can see that the process of controlling the innovative chain in all its complexity is truly a very demanding job.

4. INTERNAL FACTORS

Let us now again reconsider the situation inside the company. The company has its own production procedures, its own finances and its own management. In terms of the innovation process, these are the internal factors. (fig. 5). They all have to be included in the system of innovation development and application if we want the company to take full advantage of the innovation. The essential elements that form part of the production process include: experience in materials machining, experience in machining accuracy, experience in process planning, infrastructure, production equipment, professional knowledge, raw materials supply, production capacities, environment protection, production costs, labour legislation - social peace. The question has to be answered of how to realize the new idea in the easiest way, and whether, in the given situation, introducing the innovation is realistic.



Sl. 5. *Notranji vplivi na inovacijski proces*
Fig. 5. *Internal influences on innovative process*

5. POTI K INOVACIJI

Obstajajo različne poti k inovaciji. Podjetje odkupi pravice za izdelavo nekega izdelka. Znani svetovni izdelovalec, npr. General Motors, odkupi skoraj 50 odstotkov pravic od tujih organizacij, čeprav ima veliko svojo raziskovalno skupino. Na drugi strani so podjetja, npr. Siemens, ki so zmožna obnoviti polovico proizvodnega programa v petih letih. Vključevanje v svetovni trg odpira vse možnosti. Če kupimo celotne avtorske pravice, je tehnično tveganje najmanjše, če pa želimo inovacijo izpeljati sami, se raven tveganja močno poveča. Pri znanem izdelku je odpor tržišča majhen, ker porabniki izdelek že poznajo. Vendar je navadno z nakupom inovacije oziroma izdelka tržišče omejeno, prav tako pa je omejena doba trajanja trgovske uspešnosti izdelka. Z nakupovanjem znanja se znižuje raven izobrazbe domačih strokovnjakov, prav tako pa tudi spodbujanje lastnih sodelavcev. Čim več tujih rešitev in tujih licenc bomo kupili, tem manjša bo možnost, da bomo v prihodnosti ustrezno zaposlili lastne strokovnjake. Čakanje zmanjšuje udarno moč razvojnih ekip, predolgo čakanje pa lahko takšne ekipe povsem zatre.

Obstaja tudi možnost, da izhaja inovacijska pobuda z vodstva organizacije. Ta verjetnost je sicer majhna, kajti od vodstva ne pričakujemo toliko domiselnosti, ampak znanje, pridnost, natančnost itn., zraven tega pa se mora vodstvo podjetja zaščititi pred prevelikim tveganjem. Odpori proti inovacijam, ki prihajajo z vodstva podjetja, so bistveno manjši. Potrebna finančna sredstva so zagotovljena. Če se z novo zamislijo pojavi raziskovalec s spodnjega dela hierarhične lestvice, bo financiranje projekta vedno vprašljivo. Vse zamisli, ki pridejo od zgoraj, so sprejete v bistveno krajšem času.

6. INOVACIJSKA SKUPINA

Tretjo možnost organiziranja inovacijskega dela predstavljajo delovne skupine, ki se ukvarjajo z inovacijami. Ta oblika organiziranja je lahko zelo uspešna. Če pogledamo svetovni proces inovacij in proizvodnje, lahko rečemo, da je imela Evropa v preteklosti veliko uspehov z inovacijami zaradi dobre izobrazbe delavcev in zaradi posebnosti značaja Evropejcev. Pri Japoncih prevladuje delo v skupinah, sposobnosti posameznikov pa so v primerjavi z Evropejci celo nekoliko nižje. Pri sestavljanju delovne skupine za inovacijski proces upoštevamo posamezne lastnosti strokovnjakov (starost, izobrazbo itn.), ki jih potrebujemo za uspešno izvedbo projekta. Na kakovost dela bistveno vpliva tudi državni sistem. Sistem, pri katerem

5. APPROACHES TO INNOVATION

There are different approaches towards innovation. A company can buy the rights to produce a product. For example, General Motors, one of the leading world manufacturers buys almost 50% of rights from foreign organisations despite having a very large research team of its own. On the other hand, there are companies like Siemens, which are capable of renovating half of their production program in five years. Inclusion in the world market leaves all the possibilities open. If you buy all the copyrights in a package, the technical risk is low; if you want to introduce innovations yourself, then the level of risk is much higher. If the product is known, the market resistance to it is low, since users already know it. However, with purchased innovation or product, the market is limited by the contract and so is the time of the product's profitability. By buying know-how, you are gradually diminishing the professional knowledge of your own engineers, as well as their motivation. The more foreign licences you buy, the less possibility there will be to employ our own engineers coming from universities. "Waiting" weakens the impact force of research and development teams, and a too long waiting period can completely disable and disqualify them.

There is a possibility that the initiative for an innovation comes from the top, i.e. the management of a work organization. This is, however, not very likely to happen since it is not expected of the management to be imaginative but to possess knowledge, industry, consistency etc., not considering that the company's management has to protect themselves from too high risk. Nevertheless, resistance to innovations coming from the top is essentially smaller. The financial support is more easily found. If a new idea is presented by a researcher from the bottom part of the hierarchy, the financing of the project will always be a problem. All ideas coming from the top are accepted in a much shorter time.

6. INNOVATIVE GROUP

A third possible form of innovative work is organizing work groups involved in innovations. These can be very successful. A study of the process of innovation and production worldwide shows that Europe has in the past been very successful in innovations because of good education of its workers and special individual qualities in the character of Europeans. Japan, on the other hand, is characterized by group work, the abilities of individuals compared to those of Europeans being even slightly lower. In the formation of innovative work groups you have to combine the members' qualifications (age, education etc.) to ensure successful realization of the project. The quality of the work is also very much affected by the country's social system. Systems in which governments change rapidly, or regimes that remain in power for thirty or more years, do not provide the best conditions for innovative work.

se vlade pogosto menjavajo, ali pa so režimi, ki ostajajo na oblasti trideset in več let, ne vplivajo pozitivno na rezultate inovacijskega dela.

Najboljše okolje za uspešno razvojno delo dajejo države, v katerih se politične garniture zamenjajo v 5 do 10 letih. Raziskovalne ekipe sestavljajo starejši, prekaljeni delavci in mladi strokovnjaki. Ekipa ni stalna, vodja naj bi jo spreminjal po 2 do 3 letih. Vodja oblikuje ekipo toliko časa, da sta koordinacija in uspeh ekipe najboljši. Večina članov ekipe mora biti strokovno in teoretično zelo dobro usposobljena, kajti brez znanja ni inovacije. Čeprav smo zapisali, da šola zatira domiselnost, brez znanja ne moremo narediti ničesar. Polovica sodelavcev v ekipi naj bi poprej že sodelovala pri reševanju težke naloge. Posameznik, ki je sodeloval pri reševanju vsaj enega težkega problema in problem tudi uspešno rešil, je primeren za novo skupino, ker ve, kako težko je rešiti zamotano nalogo. Nekdo v ekipi mora dobro poznati hierarhični in organizacijski ustroj podjetja. Inovacijska skupina, ki ne pozna delovanja podjetja, nima posebne možnosti, da bo v kratkem času in na pravem mestu zagovarjala projekt in zanj tudi dobila ustrezna finančna sredstva. Mešani sestav skupine pomeni prednost. Pri sestavljanju ekipe moramo paziti, da nikoli ne povabimo k sodelovanju podrejenega in nadrejenega delavca iz iste organizacijske enote podjetja.

Osebe, pristojne za odločanje, morajo biti sproti obveščane o poteku dela v skupini. V strokovni skupini ne sme biti preveč mladih sodelavcev, ki nimajo izkušenj pri reševanju težjih problemov, niti preveč starejših sodelavcev, ker je pri inovativnem delu potrebna tudi domiselnost. Za optimalno delo je najboljša skupina od 5 do 10 delavcev, delo skupine pa naj bo omejeno na 6 do 18 mesecev. Cilj dela mora biti določen na začetku in mora biti določen skupaj z vodstvom podjetja. Delovne sestanke skupine naj vodijo različni delavci; tako lahko slišimo več različnih mnenj.

Zadnja oblika inovacijskega procesa je nadpovprečno dober strokovnjak — genij. Z njegovo pomočjo naj bi rešili vse probleme, imeti pa bi moral ogromno strokovno znanje in biti hkrati dober organizator. Tudi ustvarjalnost mu ne bi smela biti tuja. Veliko nadpovprečnih strokovnjakov je že uspešno reševalo probleme podjetij, ker pa je podjetij veliko, genijev pa malo, se raje odločamo za eno od prej naštetih rešitev.

The best environment for a successfull development work is created in those countries in which the party in power changes every 5 to 10 years research group should consist of senior experienced members and zealous young engineers. The team should not be a permanent one, its head should make changes every 2 or 3 years. The head keeps on making changes until he/she feels the coordination in the group and possibility of success are optimum. The majority of the group members have to be professionally and theoretically highly qualified, since innovations are not possible without good knowledge. Despite the previously stated fact that schools supress imagination, nothing can be done without knowledge. At least half of the group members shuld have previous experience in solving difficult problems. An individual member having experience in solving at least one difficult problem and having solved the problem successfully, is a suitable candidate for a new group since he knows how difficult problems can be solved. One of the group members should be well acquainted with the hierarchy and organisation scheme of the company. An innovative group not knowing the company's organisation flow is hardly likely to defend their project in a short time at the right place, and get the necessary financial support for it. A heterogeneous composition of the group is an advantage. In composing a group, you should take care never to put together a subordinate and a superior from the same company's department and demand they should cooperate.

Persons responsible for decision making should be daily informed about the progress of the work in the group. The professional group should consist of neither too many young engineers without any experience in solving difficult problems nor too many older members, since innovative work requires the capacity of imagination. The optimum number of members in a group is 5 to 10 in normal conditions, the project being limited to a period of 6 to 18 months. The goals must be set in advance and have to be defined in cooperation with the company's management. Meeting of the group should be led by different members, so that several different opinions can be heard.

Another, last possible form of innovative work is having an outstanding professional - a genious involved in innovations. We could solve all the problems with his help. He should possess an enormous amount of knowledge and all the qualities of a good organizer. He should also be endowed with creativity. Several outstanding scientists have successfully solved problems in companies. However, there are many companies but few geniuses, so we had better decide on one of the previously mentioned possibilities.

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