

Sistem usposabljanja na osnovi sheme kompetenc inženirjev

Trainig System Based on Engineers Competence Star

Izvleček

Na livarstvo se še vedno gleda kot na eno najpomembnejših metod proizvodnje kovinskih elementov. V zadnjih nekaj letih so v tem sektorju razvili veliko novih rešitev in tehnologij, z naraščajočim povpraševanjem po ulitkih pa se je razširil tudi obseg njihove uporabe.

Livarne se vedno pogosteje soočajo z izzivom prilagajanja proizvodne strukture nenehno spreminjajočim se zahtevam trgov, ki pa je dosegljiv z zagotavljanjem potrebnih materialov, strojev, naprav in človeških virov [1].

V moderni dobi so človeški viri v podjetjih postali vedno pomembnejši in se običajno obravnavajo kot ključni dejavnik za pridobivanje konkurenčne prednosti. Zato se v obdobju gospodarstva, ki temelji na znanju, vedno več pozornosti posveča upravljanju s kadri, zlasti z vidika kompetenc. Zavedanje, da so kompetence kadrov (spretnosti, znanje, izkušnje, sposobnosti) ključni dejavnik za uspeh podjetja, je družbe prisililo v iskanje in uporabo inovativnih orodij za njihovo upravljanje. Upravljanje s človeškimi viri na osnovi kompetenc se je izkazalo za uporabno v vseh postopkih, ki vključujejo kadre – tj. v pridobivanju novih kadrov, izbiri, ocenjevanju zaposlenih, snovanju kariernih poti in zlasti pri prepoznavanju potreb zaposlenih po usposabljanju. Ob upoštevanju potrebe po nenehnem strokovnem razvoju kadrov smo izdelali modul usposabljanja na osnovi elementov sistema upravljanja kompetenc. Namenjen je delavcem v livarnah, zlasti inženirjem na področju livarstva.

Abstract

Casting is still perceived as one of the most significant methods of manufacturing metal elements. Over the last several years many new solutions and technologies have been developed in this sector which, along with the ever growing demand for casts, have extended the range of their application.

More and more frequently, foundries have to face the challenge of adapting their production structure to constantly changing demands of markets, which is feasible by providing the necessary materials, machinery, devices and human resources [1].

In modern times, it is the human resources of the corporation that has grown more and more significant and is commonly regarded as the crucial factor in gaining the competitive advantage. Therefore, in the era of economy based on knowledge, increasing attention has been paid to the staff management, especially in the case of competency. The perception of staff competency (skills, knowledge, experience, abilities) as a key factor for company's success has compelled corporations to search and implement innovative tools to manage them. Competency-based human resources management has been found useful in all staff-related processes - recruitment, selection, employee evaluation, establishing career paths and especially in identifying training needs of employees. With regard to the necessity of constant staff development, a training module based on the elements of competency

management system has been devised. It is dedicated to foundry workers, especially casting engineers.

V obdobju gospodarstva, ki temelji na znanju, je človeški kapital eden izmed najpomembnejših virov vsakega podjetja. Zaposleni, zlasti njegove kompetence, je postal najpomembnejši vir konkurenčne prednosti. Raziskava, ki jo je Izobraževalni in raziskovalni inštitut (Educational Research Institute) izvedel v 941 poljskih podjetjih, je potrdila ta pristop. Glede na anketirana podjetja je najpomembnejši vir za podjetnike zgoraj omenjeni človeški kapital (47 %), kompetence pa so bile izpostavljene kot njegova najpomembnejša lastnost (72,2 %), sledijo kvalifikacije (49,6 %) in formalna izobrazba (39,3 %).

Izraz »kompetenca« je v okviru upravljanja s človeškimi viri opredeljen kot »znanje, spretnosti, sposobnosti, slogi delovanja, osebnost, načela, zanimanja in druge lastnosti, ki se uporabljajo in razvijajo med delom in vodijo v dosežke, skladne s strateškimi cilji družbe« [2]. To pomeni, da se kompetenca kaže v rezultatih namenskega delovanja kadrov, ki prinese učinkovito uresničevanje dodeljenih nalog [3].

Najpomembnejše lastnosti kompetenc so skladnost z nalogami, spremenljivost in merljivost [4].

Skladnost z nalogami pomeni sposobnost zaznavanja in prepoznavanja kompetenc med opravljanjem določenih nalog. Za izvrševanje številnih nalog se lahko uporabljajo določene spretnosti ali sposobnosti, hkrati pa lahko nekatere naloge zahtevajo več različnih spretnosti. Za opravljanje ene naloge je lahko potrebna tudi zgolj ena spretnost.

Spremenljivost kompetenc kaže na možnost njihovega razvoja. Ta lastnost je zelo pomembna v postopku upravljanja s kompetencami v smislu usklajevanja

In the era of economy based on knowledge human capital is one of the most significant resources of every corporation. An employee, especially his competency, have become the main source of competitive advantage. A survey conducted by the Educational Research Institute based on 941 polish companies has confirmed the validity of this approach. According to the surveyed companies, the most important resource for entrepreneurs is the above mentioned human capital (47%), and the competency was pointed as most significant among its features (72,2%), followed by qualifications (49,6%) and formal education (39,3%).

The term "competency" in the scope of human resources management is defined as "knowledge, skills, abilities, styles of action, personality, principles, interests and other features that are used and developed in the course of work and lead to achievements consistent with strategic goals of the corporation" [2]. This means that competency is revealed in the result of intentional actions performed by the staff, which facilitate effective realisation of conferred tasks [3].

The most important features of competency are compliance with tasks, variability and measurability [4].

Compliance with tasks stands for the ability to observe and identify the competency during the performance of particular tasks. A certain skill or ability may be used to fulfill a number of tasks, and at the same time some tasks may require several different skills. It is also possible that a single skill is required to carry out a single task.

Variability of competency indicates the possibility of its development. This

kompetenc kadrov s sedanjimi in prihodnjimi potrebami organizacije.

Merljivost je enako pomembna lastnost. Omogoča merjenje stopnje kompetence in določanje želene stopnje na osnovi prevzetih lestvic razvoja kompetenc.

Temelj novega trenda v upravljanju s kadri, tj. upravljanje s človeškimi viri na osnovi kompetenc, predstavlja izraz »kompetenca«. Predstavlja alternativo tradicionalnemu pristopu k upravljanju s kadri, izkazalo pa se je, da je neizpodbitno učinkovitejši v spremenljivih okoljih. Omogoča optimalno porazdelitev človeškega kapitala in usklajevanje njegovih kompetenc z zadanimi nalogami, povezan pa je z nenehnim razvojem novih tehnik in tehnologij ter z vedno višjimi zahtevami strank glede kakovosti.

Izvajanje sistema upravljanja s človeškimi viri na osnovi kompetenc zahteva uporabo ustreznih orodij in postopkov. Njegova osnova so kompetenčni model in kompetenčni profili posameznih zaposlenih. Za mnogo podjetnikov je ta pristop še vedno novost in vzbuja številne skrbi. Omejitve pri izvajanju pristopa na osnovi kompetenc so izjemno visoki stroški priprave in uvedbe kompetenčnega modela, dolgotrajnost projekta in oklevanje kadrov, ki jih skrbijo nepredvidljive posledice sprememb v podjetju.

Zaradi vedno večjih interesov glede kompetenc in njihove uporabe v postopkih, ki vključujejo kadre, smo na podlagi te lastnosti (strokovne usposobljenosti) razvili modul Smart Foundry (Pametna livarna). V modulu smo uporabili tehnike razvrščanja in merjenja kompetenc.

Upravljanje kompetenc vključuje nekaj ključnih postopkov – prepoznavanje, razvrščanje in merjenje kompetenc. V pripravljenem modulu usposabljanja smo uporabili elemente razvrščanja in merjenja kompetenc.

feature is of a great importance in the process of competency management in terms of matching the staff competency to both present and future needs of the organisation.

Measurability is an equally significant feature. It allows to measure the level of competency and to determine the desired level based on the adopted scales of competency development.

A new trend of staff management, that being the Competency-Based Human Resources Management, is based on the term "competency". It is an alternative for the traditional approach to staff management, although it has proven to be undeniably more effective in a changing environment. It allows for the optimal distribution of the human capital, matching its competency to undertaken assignments connected with the constant development of new techniques and technologies and with the increasingly higher quality requirements of customers.

The implementation of competency-based human resources management system requires the use of appropriate tools and procedures. Its basis consists of a competency model and competency profiles of particular employees.

To many entrepreneurs this approach is still an innovation and raises numerous concerns. The limitations of implementing the competency-related approach are excessively high costs of preparing and introducing the competency model, time-consuming nature of the project and the reluctance of staff concerned about the unforeseeable consequences of changes in the company.

In regard to the growing interest in the aspect of competency and its application in staff processes, the training module of Smart Foundry system has been developed based on this very feature – professional competency.

Vsak del kompetence, ki se nanaša na določeno prepoznano in ovrednoteno delovno mesto, mora biti predstavljen na lestvici. Namen je s stopnjami na lestvici določiti, kako uspešno je bila kompetenca pridobljena.

V literaturi na to temo najdemo različne primere lestvic pridobivanja kompetenc, od preprostih, dvostopenjskih lestvic, ki označujejo posedovanje ali pomanjkanje določene kompetence, do večstopenjskih lestvic. Najpogostejše uporabljena je petstopenjska lestvica.

Za izdelavo individualne lestvice pridobivanja kompetenc potrebujemo opise posameznih stopenj njihovega pridobivanja z nedvoumnimi značilnimi vedenji, ki se imenujejo vedenjski kazalniki, enako število stopenj pa moramo uporabiti za vsak posamezni del kompetence.

Uporaba enotnih lestvic pridobivanja kompetenc zagotavlja jasen grafični prikaz, kako dobro je zaposleni pridobil kompetenco, želeno stopnjo te pridobitve, kot tudi vpogled v primanjkljaje in presežke kompetenc.

Merjenje kompetence pomeni, da zaposleni označi trenutno stopnjo pridobljene kompetence v primerjavi z želeno stopnjo. Neposredni nadrejeni ocenjevanega zaposlenega ima ključno vlogo v tem postopku, zlasti v smislu višje ocene kompetence.

Ne glede na uporabljeno metodo je merjenje kompetence oblika ocenjevanja zaposlenega, ki zagotavlja povratno informacijo. Primarni cilj te metode je povečanje motiviranosti in spodbujanje zaposlenih k večji učinkovitosti pri opravljanju njihovih dolžnosti. Način, kako zaposleni prejme povratno informacijo, ima velik vpliv na njegovo delovno učinkovitost.

Techniques of competency scaling and measuring have been applied in this component.

Competency management includes a few key processes – identification, scaling and measurement of the competency. Elements of competency scaling and measuring have been applied in the prepared training module.

Each piece of competency referring to a particular work station that has been identified and undergoes evaluation has to be represented on a scale. This serves the purpose of defining how well the competency has been acquired with levels on an adopted scale.

The literature of the subjects gives various examples of competency scales, ranging from a simple, two-level scale showing the possession or a lack of a certain competency to a multi-level scales. The most commonly used is a five-level scale.

Creating an individual competency scale requires descriptions of particular levels of its acquisition with unambiguous characteristic behaviours, which are called behavioural indicators and application of the same number of levels to each piece of competency.

The use of uniform competency scales provides a clear graphic presentation of how well an employee has acquired the competency, a desired level of this acquisition and a view of competency gaps and surpluses.

Competency measurement consists in indicating the current level of competency acquisition by the employee in reference to the desired level. A direct supervisor of the evaluated employee plays a vital role in this process, especially in regard to the increase of competency assessment.

Regardless of the method adopted, the competency measurement process is a form

Uporaba kompetenc pri strokovnem razvoju zaposlenega

Proces strokovnega razvoja zaposlenega se začne z analizo potreb po usposabljanju, pri kateri se uporabijo informacije, pridobljene s kompetenčnim profilom posameznih delovnih postaj. Njegov končni učinek je določanje neskladij med trenutnimi kompetencami zaposlenega in kompetencami, ki so potrebne za ustrezno učinkovitost pri opravljanju dodeljenih nalog. Na tej stopnji vsebuje povratna informacija podatke o primanjkljajih in presežkih kompetenc, ki so običajno predstavljeni v grafični obliki.

Na podlagi prepoznanih primanjkljajev kompetenc lahko kadrovska služba začne z izvajanjem ustreznih programov razvoja. Postopek se začne, če lahko prepoznana neskladja nadomestimo z ustreznimi usposabljanji [5].

Poleg različnih metod usposabljanja se lahko postopek razvoja strokovne usposobljenosti izvaja na podlagi prenosov znanj, promocij, učenja od izkušenejših zaposlenih in različnih oblik »coachinga« in mentorstva. Njegov namen je pripraviti zaposlenega na to, da bo opravljal vedno zahtevnejše naloge in prevzel več odgovornejših delovnih mest [6].

Pristop livarskih družb k upravljanju s človeškimi viri

Specifična narava livarstva zahteva sodelovanje več kvalificiranih zaposlenih, vključno s konstruktorji in tehnološkimi inženirji. Raziskava, ki so jo opravili v poljskih livarnah, je pokazala, da imajo v konstruktorskih (tehnoloških) pisarnah potrebe po naslednjih kadrih: tehnološki inženir, strukturni inženir, vodja metalurg in vodja tehnološkega oddelka.

of evaluation of the employee that yields feedback. Its primary goal is to increase motivation and encourage employees to enhance the performance of their duties. The manner in which the feedback is communicated to the employee has a major impact on its effectiveness.

Use of Competency in Employee Professional Development

The process of employee development starts with an analysis of training needs that employs the information given in the competency profiles of particular work stations. Its final effect is the identification of discrepancies between current competency of the employee and competency needed for proper performance of conferred assignments. In this stage, feedback contains information on competency gaps and surpluses, usually presented in a graphical form.

The identified competency gaps urge the Human Resources department to start adequate development programs. The process is commenced if the revealed discrepancies can be compensated with appropriate trainings [5].

Apart from various training methods, the process of competency development can be conducted based on transfers, promotions, learning from a more experienced employee and different forms of coaching and mentoring. Its purpose is to prepare the employee to carry out more and more complex tasks and take more responsible positions [6].

Casting Corporation's Approach to HRM

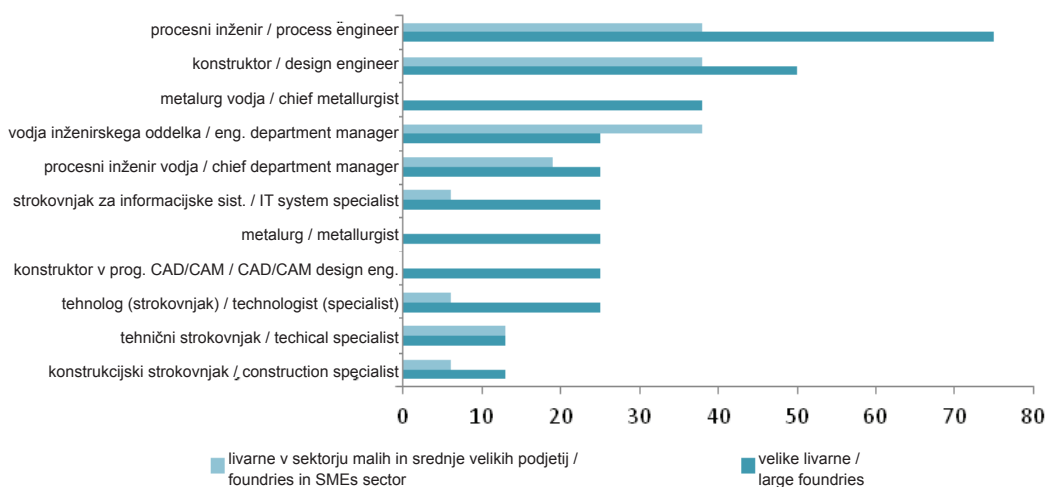
The specific nature of casting requires involvement of numerous qualified employees, including designers and technology engineers.

A survey conducted on a group of Polish foundries has shown that within the

V velikih livarnah je tehnološka ekipa sestavljena iz številnih strokovnjakov, ki so odgovorni za posamezne naloge, medtem ko v malih in srednje velikih podjetjih ekipe sestavljajo predvsem tehnološki in strukturni inženirji. Te razlike nastajajo zaradi

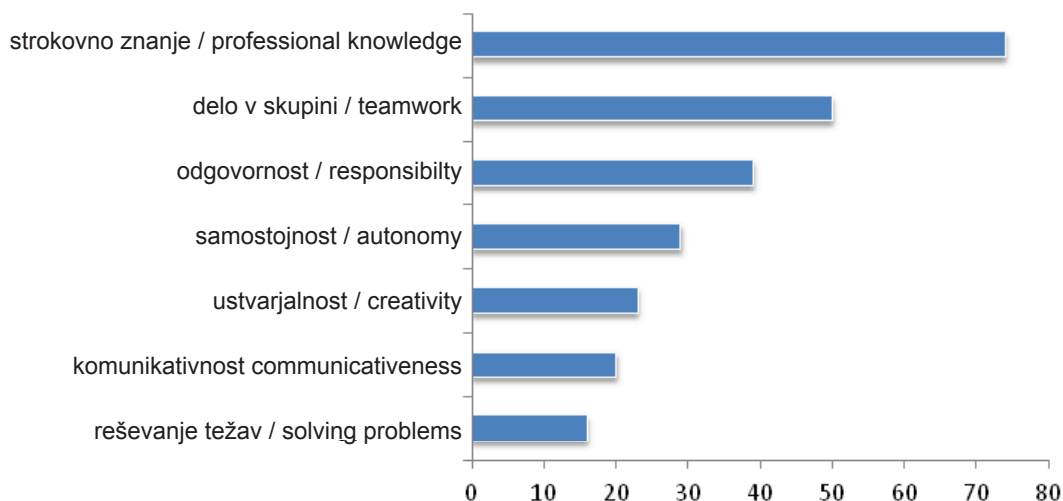
design (technological) office there is a need for positions such as: technology engineer, structural engineer, chief metallurgist and head of technology department.

In major foundries technology team consists of numerous specialists responsible



Slika 1. Kadri v inženirskem oddelku v livarni

Figure 1. Positions in engineering department in foundry



Slika 2. Osnovne kompetence, ki se pričakujejo od kandidatov za delovna mesta

Figure 2. Basic competencies expected from job candidate

zahtevnosti proizvodnega procesa, obsega in narave proizvodnje ter finančnega ozadja družb.

Kljub vedno večji potrebi po strokovnjakih na področju livarstva že leta opažamo pomanjkanje ustrezno kvalificiranih kadrov. Razlog je zlasti omejena izobrazba na tem področju in manjša priljubljenost livarskega poklica.

Pomanjkanje ustrezno kvalificiranih delavcev in omejene zmogljivosti na tem področju so razlogi za uvedbo sistema upravljanja s človeškimi viri na osnovi kompetenc [1].

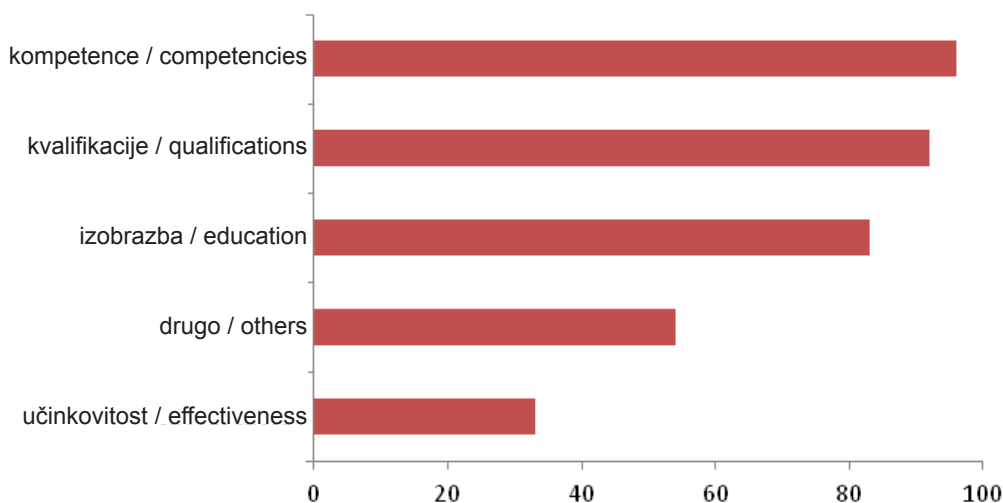
Ta koncept vedno pogosteje uporabljajo družbe v livarski industriji. Študija, ki smo jo izvedli, je pokazala, da se je 67 % anketiranih livarn strinjalo z izvajanjem pristopa upravljanja s človeškimi viri na osnovi kompetenc, kar nakazuje, da so kompetence zaposlenih po njihovem mnenju eden ključnih virov. Opisi delovnih mest se v livarskih družbah uporabljajo pogosto, medtem ko je redno ocenjevanje zaposlenih redka praksa. 96 % anketiranih

for particular tasks, whereas in small and medium-sized foundries teams are based mainly on the technology and structural engineers. Those differences are caused by the the production process complexity, capacity and nature of production as well as the corporation's financial background.

Despite the growing demand for specialists in the field of casting, the lack of appropriately qualified staff has been observed for years. It is caused mainly by limited education in this scope and the decrease in the popularity of foundry worker profession.

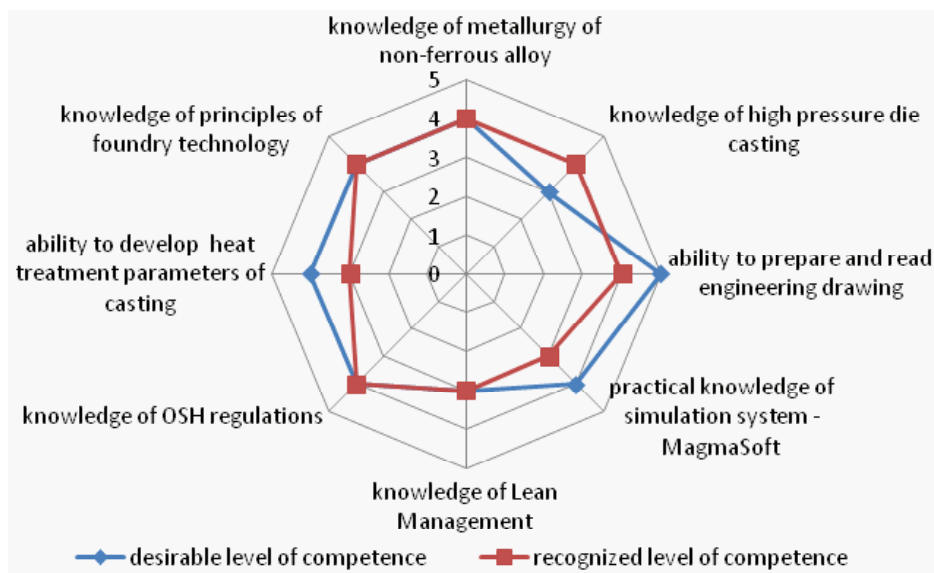
Shortage of properly qualified employees and limited capability in this area stimulate the implementation of competency-based human resource management system [1].

This concept is more and more often employed by corporations operating in the casting industry. A self study has shown that as much as 67% of surveyed foundries declare competency-based approach to HRM which indicates that employees'



Slika 3. Ključni profili v postopku pridobivanja novih delavcev v livarnah

Figure 3. Key profiles in recruitment process in foundries



Slika 4. Primer sheme kompetenc

Figure 4. Example of competency star

družb se zaveda potrebe po strokovnem razvoju svojih kadrov in izvaja različne ukrepe, povezane z razvojem, med katerimi sta najpogostejša mentorstvo in interno usposabljanje.

Modul usposabljanja Smart Foundry

Modul usposabljanja Smart Foundry smo razvili na osnovi analize strukture kadrov, ki smo jo izvedli za potrebe livarske industrije, in priljubljenosti kompetenčnega pristopa (oziroma njegovih elementov) v livarskih družbah. V modulu so uporabljena orodja sistema upravljanja s človeškimi viri na osnovi kompetenc, namenjen pa je inženirskim kadrom, zaposlenim na različnih oddelkih livarskih družb. Glavni namen tega modula je prepoznati primanjkljaje kompetenc zaposlenih in določiti predmete usposabljanja za odpravljanje teh primanjkljajev.

competency is regarded as one of the key resources. Work station descriptions are commonly used in casting corporations, whereas periodic evaluation of employees is a rare practice. In the scope of professional development of employees as much as 96% respondents are conscious of the need for the development of their staff and take various development-related steps, mentoring and internal training being the most common.

Smart Foundry - Training Module

The Smart Foundry training module has been developed on the basis of staff structure analysis carried out for the needs of casting industry and the popularity of the competency-based approach (or its elements) in casting corporations. The module uses tools of the competency-based human resource management system

Na podlagi ankete smo sestavili seznam glavnih nalog, ki se dodeljujejo procesnim inženirjem (livarskim tehnologom, metalurškim tehnologom, tehnologom za litje v pesek) in ki jih ti opravljajo v različnih celicah livarne, ter kompetenc, ki so uporabne pri njihovem izvajanju. Stopnjo pridobivanja kompetenc smo opisali s pomočjo petstopenjske lestvice, pri čemer stopnja 1(A) pomeni pomanjkanje kompetence, 5(E) pa pomeni strokovnjaka na določenem področju.

Oseba, ki upravlja z modulom – uporabnik, mora najprej s pomočjo preverjanja označiti ključne kompetence, ki so potrebne za določeno delovno mesto in se uporabljajo za opravljanje nalog, dodeljenih temu delovnemu mestu. Vsota vseh označenih delov kompetence mora biti med 8 in 12, zato je treba označiti samo ključne spretnosti, sposobnosti itn., ki so najpomembnejše za neko delovno mesto in pripadajoče naloge.

Profil ocenjevanega zaposlenega mora sovpadati s kompetenčnim profilom tega zaposlenega v podjetju, ki se poslužuje modula. Ta bo pozneje omogočal ustrezno dodeljevanje želene kompetence in njenih stopenj ter vmesno ocenjevanje trenutno prepoznanih stopenj kompetence.

V naslednjem koraku je treba zbrati podrobne opise stopenj pridobivanja posameznih delov kompetenc skladno s prevzeto petstopenjsko lestvico. Natančni in točni opisi posameznih stopenj pomenijo zanesljive ter točne povratne informacije glede potrebnega usposabljanja.

Modul zahteva tudi vnos želenih delov kompetenc in rezultatov preverjanj zaposlenih (diagnosticirane stopnje) v sistem.

Vneseni podatki so nato predstavljeni na shemi kompetenc, ki jasno prikazuje prepoznane primanjkljaje in presežke kompetenc. Najpomembnejši končni podatki

and is dedicated to the engineering staff employed in various departments of the casting corporation. The main purpose of this component is to identify the employees' competency gaps and determine the subjects of trainings to address them properly.

Based on a survey, a list of main tasks assigned to process engineers (casting technologist, metallurgy technologist, molding sand technologist) has been compiled, which are performed in different cells of the foundry and competency useful in their realisation. The competency acquisition level has been described with a five-level scale, where 1(A) level stands for the lack of competency and 5(E) – indicates an expert in the particular field.

A person handling the module – a user must first indicate the key pieces of competency required for a particular (undergoing a verification) position, employed for the performance of tasks assigned to that position. The sum of all indicated pieces of competency should be between 8 and 12, therefore only key skills, abilities, etc. should be indicated, which are those of the greatest significance in regard to the position and tasks assigned to it.

The profile of the evaluated employee should coincide with the competency profile of that very employee in the company employing the module. It will later allow to properly allocate the desired competency and its levels and use the interim evaluation to indicate currently identified competency levels.

Next stage comprises in compiling thorough, detailed descriptions of acquisition levels for specific pieces of competency in accordance with the adopted 5-level scale. Preciseness and accuracy of the descriptions of particular levels results in reliable and accurate feedback concerning necessary trainings.

modula usposabljanja so informacije o področjih, ki jih morajo usposabljanja pokriti, in o predmetu takšnih usposabljanj.

Informacije o presežkih kompetenc se lahko uporabijo za imenovanje »coachev« za notranja usposabljanja na področju zanimanja, kjer se pojavljajo presežki.

V primeru družb, ki s človeškimi viri upravljajo po tradicionalnih postopkih, lahko modul usposabljanja Smart Foundry služi kot orodje za opise delovnih postaj na osnovi kompetenc in za izvajanje rednih ocenjevanj zaposlenih, vključno s kompetenčnim vidikom.

Izvajanje tega modula poteka v dveh korakih:

Korak 1 – oblikovanje kompetenčnega modela, tako imenovanaknjigakompetenc, ki je sestavljena iz določanja delov kompetenc, ki so ključne za podjetje, in izvajanja diagnoz zaposlenih, ki so kompetenčno ustrezni za celotno organizacijo.

Korak 2 – oblikovanje kompetenčnih profilov, t. i. opisi delovnih mest z deli kompetenc, zbranimi v knjigi [7].

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Subsequently, the module requires that the given desired pieces of competency and results of the verified employee evaluation (the diagnosed levels) are entered to the system. The entered data is presented on a radar chart (a so-called competency star) that clearly shows the identified gaps and surpluses of competency. The ultimate outcome data of the training module is the information about the areas that need to be covered with trainings and about the subject of such trainings.

The information on the competency surpluses can be used to designate the coaches for internal trainings in the area of interest to which the surpluses apply.

In case of corporations employing traditional human resources management processes, the training module of Smart Foundry system may serve as a tool for creating competency-based descriptions of work stations and for conducting periodical evaluations of employees that include the competency aspect.

The course of this module can be presented with two stages:

Stage 1 - creation of competency model, the so-called competency book, that comprises in determining the pieces of competency that are pivotal for the company and conducting a diagnosis of employee competency appropriate for the whole organisation.

Stage 2 - creation of competency profiles, i.e. descriptions of work stations with the pieces of competency compiled in the book [7].

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