

Skill Management

Abstract

Today's competitive and enterprising industry requires that all organizations must optimally use all of its resources. To deliver more business value, technology must support HR and recruitment team for real-time data of available resources skill sets. This strengthens the process improvement and they will spend less time on traditional administrative activities and more time on strategic planning for optimal resource utilization. It is very difficult to combine project management and human resource management in a very effective and efficient manner without the help of proper skill management technique.

Introduction

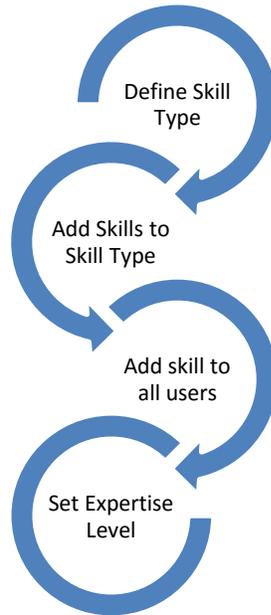
Managing and improving skills of its employee is a tough task for companies. Most of them don't have the proper knowledge of the skills possessed within the organization. Companies well informed of the skills and the knowledge of their employees will be able to fulfill the following items:

- find the right single employee for a specific task or project
- retrieve and assemble flexible project teams
- develop and update employees skills
- explore the employees future career path

The employment of skill management systems can prove to be very efficient for service providers particularly when changing project and the flexible roles of the employees necessitate short reaction times in time-critical projects. The human resource management processes like personal planning, recruiting, selection or development benefit from a successfully implemented skill management system.

Skill Management and Assessment Process

In many companies skill management systems are driven, developed and managed by the human resource department. Skill Matrix is an exceptional technique to record and view the skills of all the employees of an organization.



Underlying Mathematical Model

The Skill Matrix is founded on the following model which describes the mapping between skills and employees based on a knowledge function. The skill matrix will master a search problem if a candidate possesses a set of skills necessary for a project to be planned.

We define a relation between user and his skills

Let E be the set of employees in an organization and $S \neq \emptyset$ a set of skill sets.

A mapping $\lambda: E \rightarrow 2^S \setminus \{\emptyset\}$ which assigns to each employee $e \in E$ a subset $\lambda(e)$ of skills is called a skill set for E . The set $\lambda(e) \subseteq S$ is called the set of skills associated with E . To each employees $e \in E$ a set of latent skills $\lambda(e)$ necessary to solve i is associated.

Given a skill function λ , let $K \subseteq S$.

A mapping $\mu: 2^S \rightarrow S^E, K \rightarrow \mu(K) := \{e \in E \mid e \cap K \neq \emptyset\}$ which assigns a subset of E to each subset K of S is called a knowledge function.

An Employee set $E = \{e1, e2, e3, e4, e5\}$ and a skill set $S = \{s1, s2, s3, s4\}$ with the skill function S

$\lambda: E \rightarrow 2^S$ are defined by the table:

$e \in E$	e1	e2	e3	e4	e5
$\lambda(e)$	{s1, s2}	{s2, s3}	{s1, s3}	{s2}	{s1}

The corresponding knowledge function $\mu:2^S \rightarrow 2^E$ is given by the table:

$K \subseteq S$	\emptyset	$\{s1\}$	$\{s2\}$	$\{s3\}$	$\{s1, s2\}$	$\{s2, s3\}$	$\{s3, s1\}$	$\{s1, s2, s3\}$
$\mu(k)$	\emptyset	{e1, e3, e5}	{e1, e2, e4}	{e2, e3}	{e1, e2, e3, e4, e5}	{e1, e2, e3, e4}	{e1, e2, e3, e5}	{e1, e2, e3, e4, e5}

$\mu(K)$ is defined as a knowledge space. The union of any two knowledge states is again a knowledge state. With this knowledge function more than one subset of skills can be assigned to one set employees.

Skill Set consists of a set of experiences and qualifications that are divided into hard skills (databases like DB2, SQL-Server, Progress, Oracle; programming languages like COBOL, PL/1, ICS, JAVA, C++, SmallTalk, XML; computer systems like MVS, Microsoft, Linux, ...) and soft skills (leadership, motivation, teamwork, ...).

The function that is listed above is to find the chunk of employees with a group of skill sets required for a project in a very fast and flexible manner.

User skill Attributes

The storage of various skill attribute is important for getting good search result

- name: Unique name for a skill in the database e.g. JAVA, PHP
- type: Group in which this skill is used e.g. Development, Quality Analysis
- description: Description about the skill
- Level: Scale of expertise (Beginner, Intermediate, Advanced)

Administration of skill matrix

Defining of skills for all the employees of an organization along with a provision to add new skill and users as required.

Filtering

The primary functionality of skill matrix is to find the employees with a particular skill type required for a project.

Skill Management Summary

[Skill Matrix](#)

Skill Matrix is an essential tool for organizations to take inventory of skills of its workforce. Use the skill matrix to guide training programs and review project composition.

- [Define Skills](#)
- [Define Skill Types](#)

Your organization's summary
14 skill defined in **5 skill type**.
13 user with skills defined.
6 do not have any skills defined.

Next steps

Search for users by skills
 See skills for Project
 See skills for
 View **your skills**.
 View the **skill matrix** for entire organization.

Top skills

[jQuery](#) (6)
[PHP Programming](#) (6)
[French](#) (6)
[Amazon Web Services \(EC2/RD, etc\)](#) (5)
[Spanish/Espanol](#) (5)

Visualization

As a 2D matrix (Employees X Skills)

Skill Matrix

Filter users by selecting Department, Project Group and Projects.

Filter skills by using Skill Type.

Department: |
 Project Group: |
 Project: |
 Skill Type:
[Previous](#) | [Next](#)

Skills → Users ↓	Java	PHP	Spring MVC	jQuery	RoR	AngularJS	CSS3	Node.js	AWS	jMock
Aaron Blash	9 (Perfect)	10 (Perfect)		6 (Average)		10 (Perfect)	6 (Average)		6 (Average)	5 (Average)
Alistair James	10 (Perfect)			2 (Poor)	10 (Perfect)		10 (Perfect)			7 (Average)
Anita Williams		7 (Average)		10 (Perfect)				10 (Perfect)		5 (Average)
Bob Cofod									10 (Perfect)	
David Balash	10 (Perfect)		10 (Perfect)	7 (Average)		10 (Perfect)			10 (Perfect)	8 (Perfect)
Kevin Kelly		9 (Perfect)								
Kusti Franti	10 (Perfect)		10 (Perfect)			8 (Perfect)				

References

1. A Practical Knowledge-based Approach to Skill Management and Personal Development by Wolfgang Hiermann, Max Hofferer – Journal of Universal Computer Science, 2003
2. Skill and Competence Management as a Base of an Integrated Personnel Development (IPD) – A (2003) by S Beck, Journal of Universal Computer Science.