Skill Management and Crowd Sourced Skill Assessments in Modern Services Organizations

Processes and Tools for Today's Dynamic Organizations

Abstract

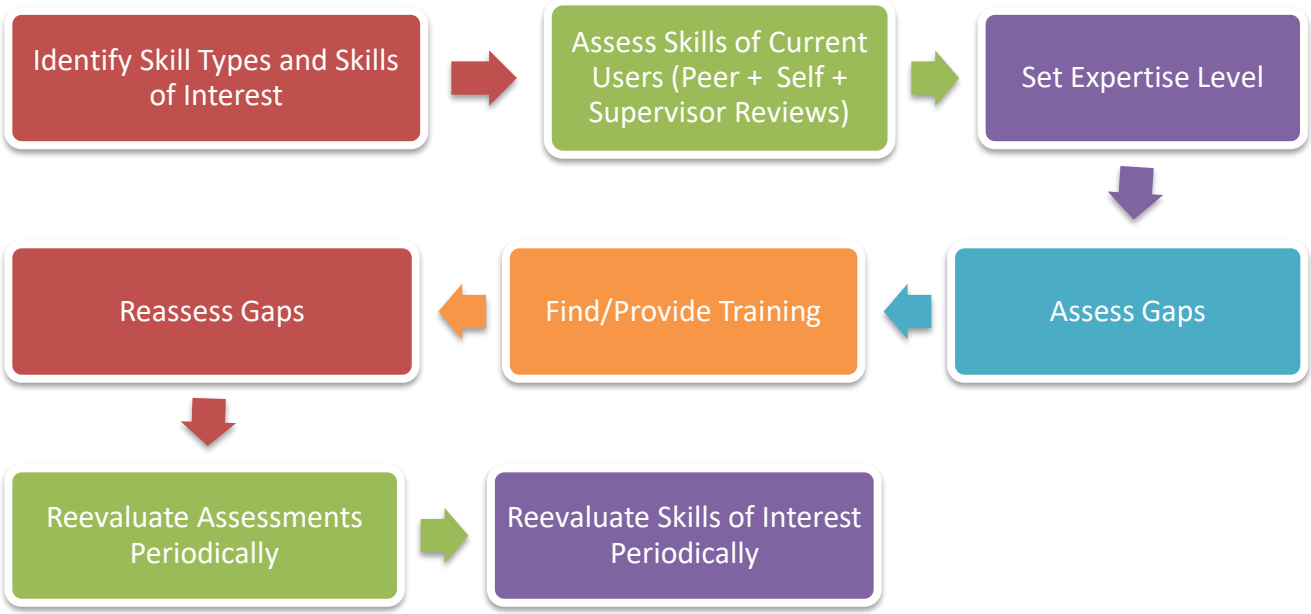
Organizations that have a complete and up to date catalog of their peoples' skills are able to retrieve and assemble project teams optimally, increasing the likelihood of the success of these projects. Having a robust and complete skill management and assessment platform also allows such organizations to develop team members' skills, and shape the team members' career paths improving the overall team satisfaction and retention. A key obstacle in this endeavor is the effort required to maintain skill matrix and specifically skill assessments. We propose a crowd sourcing mechanism, wherein skill assessments are inferred from performance feedback given by users to other users. We discuss the applicability of such model to services organizations and consider the impact on inter-personal dynamics.

1 Introduction

In today's dynamic organizations, teams are being increasingly deployed to handle short term projects, typically only lasting a few weeks to a few months at a time. In such short term projects, it becomes even more critical that the team members have the required combination of skills. Therefore, having an organization wide skill matrix that also encompasses current and future resource availability becomes a key enabler for services organizations.

2 Skill Management Process

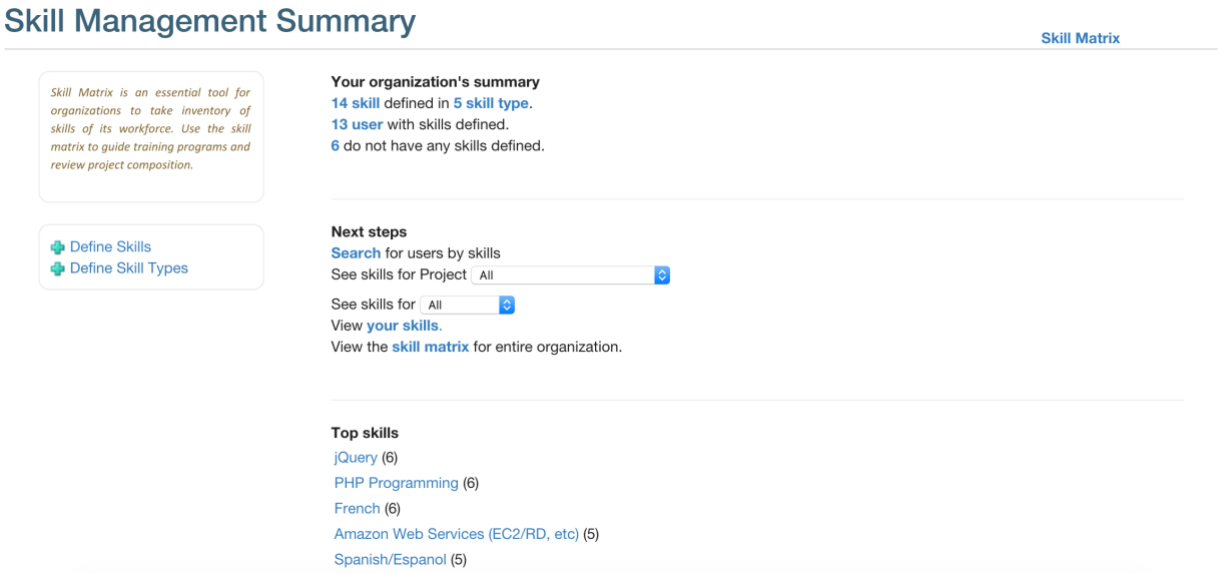
In many organizations, skill management systems are driven, developed and managed by the human resource department with inputs from operations/services/practice teams across one or more departments. Overall process can vary but usually follows the following broad outline.



2.1 Skill Assessment

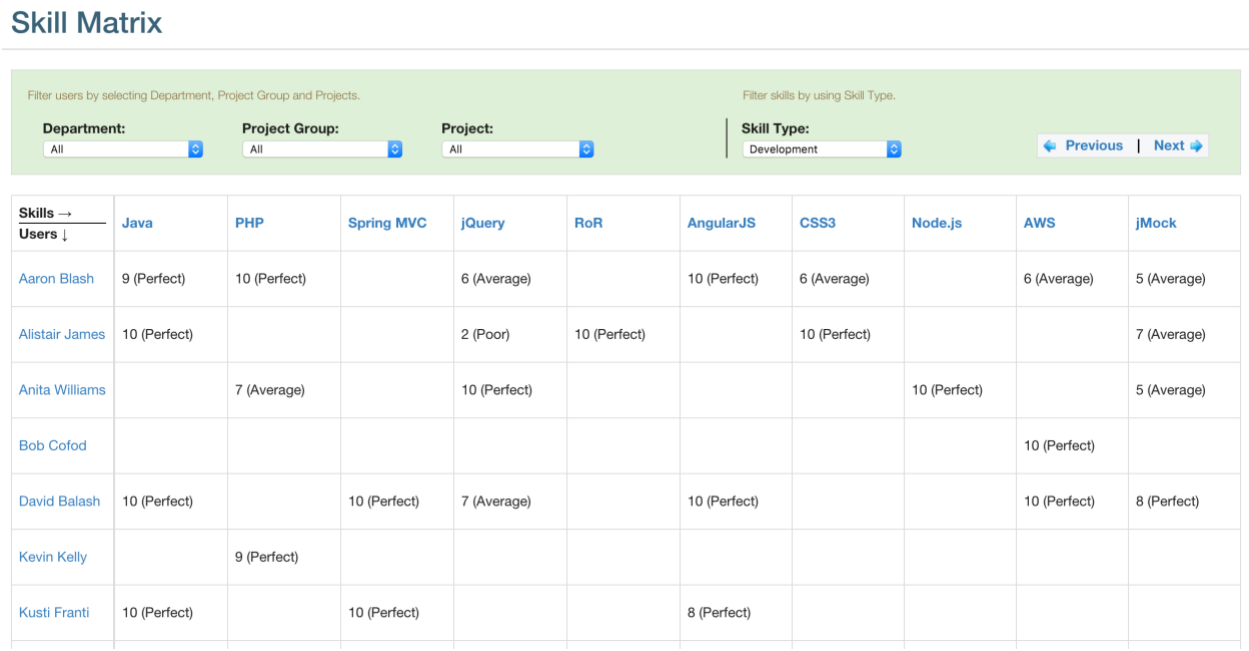
In ths process, one of the key steps is that of skill assessment. While earlier this step used to

2.2 Organization Wide Summary



2.3 Visualization of the Skill Matrix

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: All | Project Group: All | Project: All | Skill Type: Development | 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)				

3 Key Challenges in Accurate Skill Assessments

3.1 Skill Matrix Mathematical Model

The Skill Matrix is founded on the following model which describes the mapping between skills and employees based on a knowledge function.

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 ∈E	e1	e2	e3	e4	e5
λ(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 ⊆ S	Ø	{s1}	{s2}	{s3}	{s1, s2}	{s2, s3}	{s3, s1}	{s1, s2, s3}
μ(k)	Ø	{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}

μ(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++, SmalTalk, 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.

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.