R2R Faculty Appraisal System

Krishnamoorthy A, Srimathi H

Abstract: The performance, achievement and contributions of faculty members in teaching-learning, research and administration constitute a major quality indicator in higher education institutions. The institutions are always in a need to maintain faculty profile, as it is one of the key determinant factors in approval, accreditation, ranking system, and also in choice of institution in admission process. The institutions do the periodic performance evaluation of the faculty to cope-up and meet their statutory demands. The faculty profile is not updated at many times and the data collection process is repeated through mails, word, excel, or paper as and when required. The invention proposes using electronic forms (e-Form) of maintaining Faculty Profile in entire Recruitment to Retirement (R2R) life cycle. .

Index Terms:Performance Appraisal, Ranking, Research Parameters, e-Forms, ECM

1 INTRODUCTION

Faculty members play a significant role in the life of institutions to compete both at national and global platform. Institutions expect their faculty members to improve teaching, show commitment in student development, maintain the highest professional standards of character and conduct, research innovation, and participation in the activities such as workshops, seminars, conferences etc., of professional organizations. The emphasis of invention gains additional impetus as the faculty profile is populated on multiple forms including institution website, approval, accreditation, ranking processes and performance appraisal system. This has necessitated the holistic approach in faculty information which covers all dimensions including teaching, mentoring, research and extension activities. There are some institutions which make use performance appraisal software for annual and career advancement scheme (CAS), but they work isolated and lack on workflow automation (Dhamne et al, 2017). The institutions repeat data collection process and spend more time on report creation. The current study has used e-form technology for Faculty profile maintenance.

2 E-FORMS

The e-form technology promises user friendly data collection, storage, distribution with automated workflow. The electronic content management (ECM) is the underlying structure in e-form which helps in data capture, manage, and preserve to deliver structured, semi-structured and unstructured data (AIIM, 2010). ECM has bundle of services including document, web content, forms, records, digital asset and workflow management.

- *Krishnamoorthy A, Professor & Associate Dean, Department of Electronics and Instrumentation Engineering, SASTRA Deemed University, Thanjavur, E-mail: ak@eee.sastra.edu*
- *Srimathi H, Professor & Assistant Director, Directorate of Admissions, SRM Institute of Science and Technology, Chennai, India. E-mail: srimathh@srmist.edu.in*

The features of multiple data callouts; field level validation and embedded process logic in e-Forms (as shown in Fig. 1) enhance the efficiency. The intuitive workflow accelerates intelligent service delivery. The invention proposes to manage the entire life cycle of a faculty profile using e-Form in order to improve data capturing and to facilitate faster data retrieval in the required format as expected by various stakeholders.

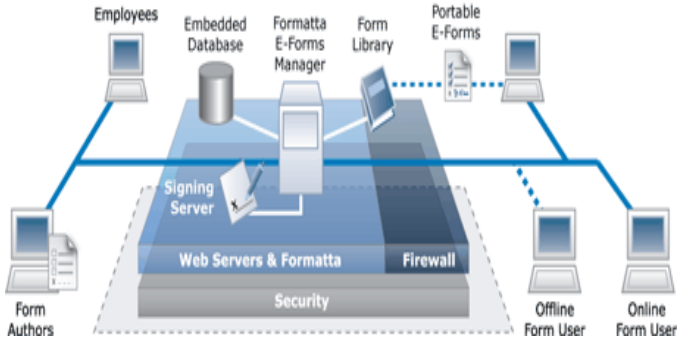

Fig. 1. *E-Forms Architecture (Source : TransForm)*

3 OBJECTIVES

The objective of the project is to automate faculty profile system in higher education with the following list of objectives: Map institution goals with individual faculty objectivesGet insight into faculty profile, rate performance, increase productivity and improve talent retention Streamline data collection and populate just-in time reports Minimize redundancy through integration with other application modules such as attendance management, student's feedback, result analysis and research outcome Measure and Predict required outcome in research and other critical parameters which determine institutional ranking and accreditation Compare, analyse & grade the faculty using list of performance indicators Eliminate paper work / time consumption and track faculty profile from hire to retire

4 IMPLEMENTATION

The quality of higher education institutions are predominantly measured by the quality of their faculty members. They are expected to maintain minimum qualification standards, upgrade their professional knowledge, mentor and administer the student community, engage and collaborate with industry & research projects. The institutions are recommended to exhibit their academic credentials through their faculty strength in various forums including student admission. The scattered paper-based or semi-computerized data capturing will be

difficult for consolidating various level of reports (Jahagard, 2003). The faculty profile using e-forms facilitates simplified data capturing and helps the management to retrieve formative / summative and graphical outputs (Sheih et al, 2014). The complete input, output interaction flow of faculty profile is given in Fig. 2. The fields of e-forms are added with reference to the statutory and institution requirements. The job applicant is analysed, screened, interviewed and acquired using Artificial Intelligence algorithms. The Human Resource (HR) department is responsible to initiate individual faculty e-form while joining. Their personal information, previous qualification, experience, other academic credentials are to be captured in e-Form along with present salary details and appointment norms. The scanned copies of degree certificates, awards, recognitions, experience certificates and appointment contracts are preserved as E-Documents. The work-flow and approval hierarchy of faculty is also assigned. The faculty members are permitted to update their profile as and when required (SRM, 2016).

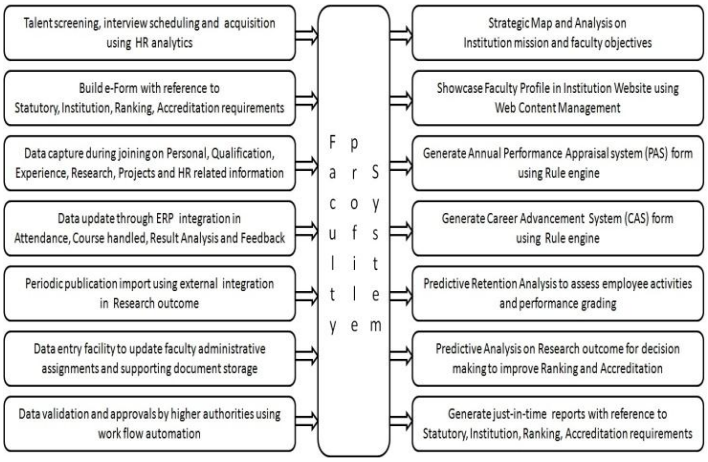

Fig. 2. *The input and output flow of Faculty Profile system*

The module integration of faculty profile is descried in Fig. 3. The HR department is responsible for sharing initial record and salary revisions. . The faculty members are encouraged to upload certificates of additional qualification and recognitions in due course of time and the same is maintained by electronic document storage. The summary of leave details under casual, medical, earned, vacation and loss-of-pay for particular period is provided by attendance module, which is maintained by HR department (Pollock, 2014). The student information module is sharing teaching assignments with respect to course title, type, and lecture hour, number of students, pass %, and feedback point. The inputs gathered in faculty profile are integrated through web-content management norms to display faculty profile in institution website.

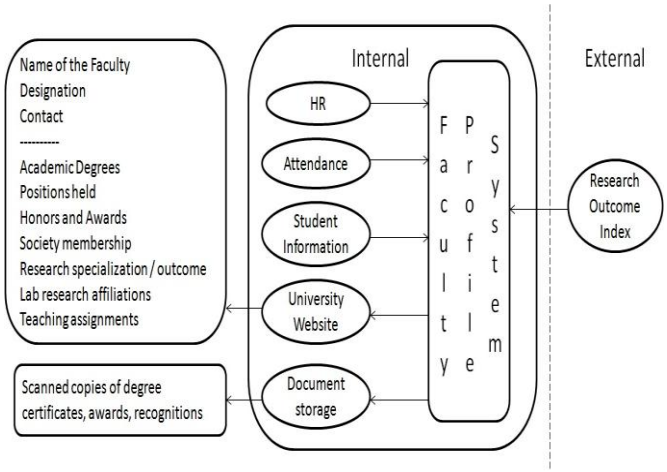

Fig. 3. *Internal & External Modules for integration*

The institutions face challenge on cumulating research outcome from various external databases as it is one of the major parameter in accreditation and institution ranking. The research outcome is obtained through calling Application programming interfaces (API) provided by external research index databases wherever possible. The steps involved in Invoking API are shown in Fig. 4 (Rose et al, 2019).

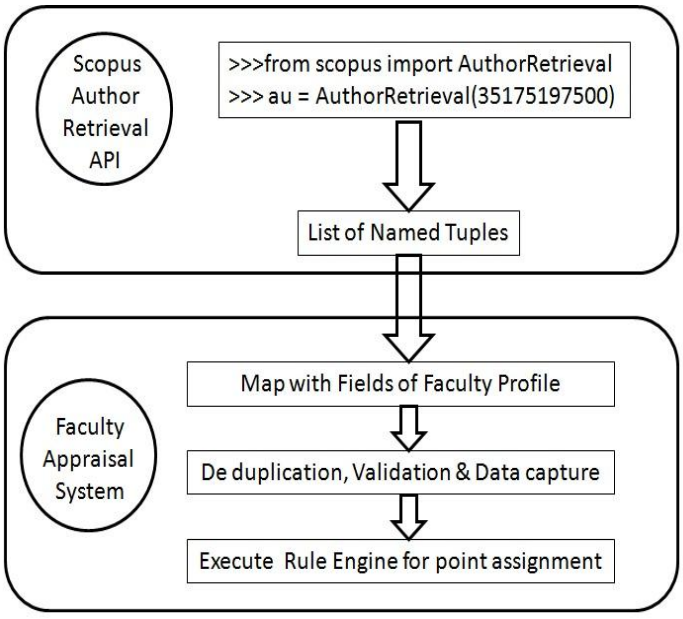

Fig. 4. *Call of External API for Research Outcome*

The detailed category-wise components of Academic performance Indicators used in Faculty Profile (UGC, 2018) is given in Fig. 5. The teaching-learning related assignments are listed in category I, administration capability in category II followed by Research activities in Category III. The senior faculty members of institution of higher learning are expected to score more weightabge in Research activities.

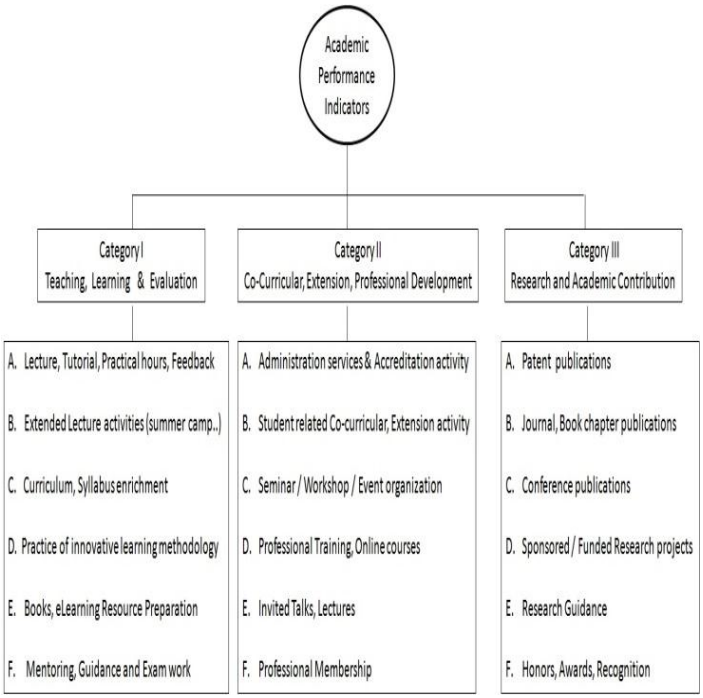

Fig. 5. *Category-wise Academic Performance Indicator*

The generic steps in rule engine for both annual performance and cadre assessment system is given in Fig. 6. The point calculation example given in Fig. 7 shows weightage of Category III, wegithage of sub-component paper publication and the individual score point calculation with respect to different category of journals. Further the year-wise minimum API required under category III for cadre revision is listed. The given example is used to understand the complexity of score-point calculation for all the sub-components of academic performance indicators mentioned in Fig. 5. The measurable performance indicators reduced the subjectivity of performance appraisal system and helped to evaluate institution quality.

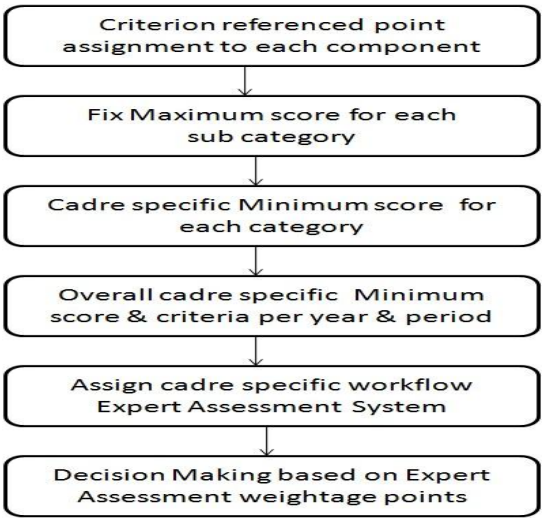

Fig. 6. *Flow of Rule Engine Formation*

Category III Research Activities (100 points)

A. *Research Publications*

Paper Publications (30 points)

Scores for publication will be calculated based on Impact Factor (IF) and Source Normalized Impact per Paper (SNIP) with equal weightage. Full weightage will be taken for publications in which you are the first / corresponding author and one-third weightage will be taken for other publications.

Points for publications as first / corresponding author 10 – *SCI /SCIE paper*; 5 – *SCOPUS paper*		*Points for publications as other authors* 3.33 – *SCI /SCIE paper*; 1.67 – *SCOPUS paper*			
*Combined Score for first / corresponding author publications = IF * 0.5 + SNIP * 0.5*		*Combined Score for publications as other authors = (IF * 0.5 + SNIP * 0.5)/3*			
Combined Score	**0-2.5**	**2.51-5.00**	**5.01-7.50**	**7.51-10.0**	**>10.0**
Combined Score Points	**2**	**4**	**6**	**8**	**10**

S. No	Journal Name	Year, Volume, Page No	First / Corresponding / Other Author	SCI / SCI-E / SCOPUS	Points for Publications	Impact Factor	SNIP	Combined Score

Paper Publication Points (PPP) = Points for Publication (Max 20) + Combined Score Points (Max 10)

Minimum API score for CAS Associate Professor to Professor

Category I Teaching Learning Examination	75 / Year
Category II Co-curricular, Extension Activities	15 / Year
Minimum Total Average Annual Score under Category I and II	100 / Year
Category III Research, Academic contribution	40 / Year (120 / Assessment Period)
Expert Assessment System	Selection Committee
% distribution weightage in Expert Assessment	50 % Research 30 % Domain Knowledge, Teaching practice 20 % Interview Performance

Fig. 7. *Performance Point Calculation in Rule Engine*

The benefits of faculty profile using e-forms are realized through assigning business process workflow at various stages (Laurel, 2003). The automated work-flow is providing tremendous benefits on secured data streamlining, tracking, validation and improved efficiency. Fig. 8 shows the workflow of annual performance appraisal system. In the beginning of academic year, faculty members are directed to set their objectives and targets of the year in accordance with institution mission. At the end of the year, the Annual Performance Appraisal system is executed and the output is captured in desired format. The system is flexible enough to execute the rule engine in-between to know their present score and improve the performance (Unnati, 2013). The feedback provided by superiors and decisions are reflected back to faculty members for further appeal. The faculty members are also graded to know their position. This facilitates institution to identify and reward faculty members based on performance. The predictive analytics based on capturing social network activities help to forecast the employee retention.

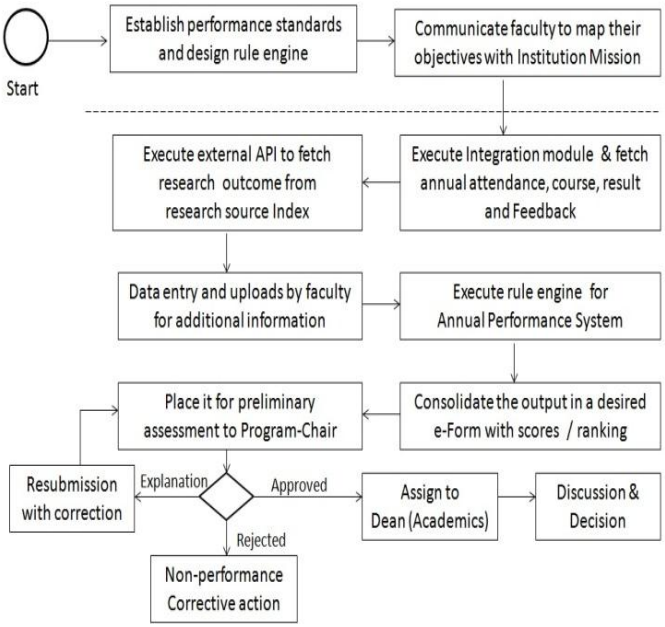

Fig. 8. *Workflow of Annual Performance Appraisal System (PAS) decision*

The main benefit of capturing all relevant information in faculty profile is to avoid redundant data collection. The e-Forms support output of data format in PDF, CSV and XML formats as required by the institution (eSAFE, 2010). The report dashboard shown in Fig. 9 is an example where institutions can generate reports in the pre-defined format. The automatic token raising and communication based on log details will be sent to individual who have not updated their details. This speeds-up the administrator work to submit statutory regulations on time.

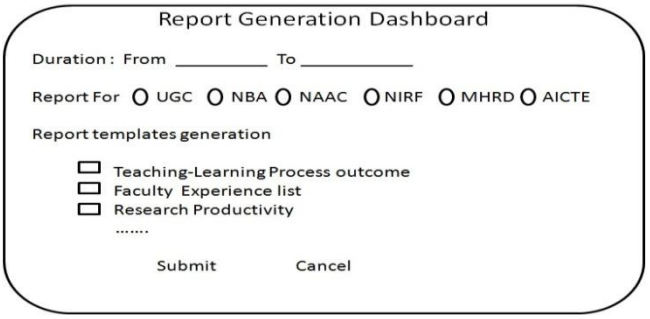

Fig. 9. *Example of Report Dashboard*

5 BENEFITS

The implemented R2R Faculty profile is efficient in data capturing and extraction using cloud (Shah et al, 2015). The secured workflow with high degree of granularity is ensured through proper authentication. The system provides simplified design template, facilitates human-centric approach and optimize data entry. The institutions gain efficiency using electronic workflow and reduced manual paper based work.

The R2R faculty profile collectively represents academic credentials of faculty, their qualification, teaching assignments, administrative role and research activities. The faculty members can fix individual goals and map with institution goals. The annual and cadre revision performance appraisal are executed and validated with the assigned work-flow for decision making. The usage of Artificial Intelligence and Machine learning in R2R faculty system benefits The institutions to attract, hire and find hidden talents and retain talented faculty The institutions to predict and accelerate towards global ranking The faculty members to predict their scores and improve their performance The faculty related parameters in various accreditation bodies and ranking system are need not be done isolated, instead the system permits to find predictive scores, use report templates to retrieve formative and cumulative reports. The website of the institution as one of the important digital marketing resource can be made automated and updated showcasing of faculty information. The form template and points in rule engine parameter can be modified, whenever there is a revision notified as per regulatory requirements. The revised norms will be followed for further processes. The elimination of paper work and reduction of time in report consolidation improves administrative efficiency.

6 CONCLUSION

The institutions faced the challenges of paper-based / semi-automated data capturing of faculty information. The intensive loads of prior art forced the institutions to innovate and simplify faculty appraisal system in compliance with statutory norms and regulations. The cadre-wise, criterion based score points suggested by statutory councils ensure uniformity and avoid skewed rating used to happen in subjective analysis The R2R faculty profile enabled the institutions to implement such complex unified criteria in online performance reviews with increased productivity. It is easy for both institution and faculty members to measure their targeted objective in a regular interval and to stimulate their efforts to advance in academic ranks. The institutions are also able to identify potential talents in specialized areas and plan for superior rewards, collaborations and retention. The simplified and streamlined business process is ensured using single page e-forms instead of complicated multipage, multi-tab transactions. Thus the R2R faculty profile accelerates institution productivity and time saving.

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