ABSTRACT

There are a lot of industry or programming related knowledge are tacit, individual, internal, or project specific that need to be transferred into written, explicit, corporation-utilized, and externalized assets. The SAS® programming knowledge management will enable higher levels of performance by dynamically connecting people to people, people to technology, and people to data. Whether the knowledge of the best programming practice of each individual programmer can be captured, retained, transferred and shared will be dependent on how the programs are designed, organized, documented and become institutionalized. The best programming practice should be based on an effective knowledge management system that is aiming at knowledge learning, knowledge sharing and knowledge transferring.

INTRODUCTION

Ostensibly, the knowledge management of SAS programming is a matter of it-goes-without-saying. Most of the process of data extraction, transfer, derivation, analysis and reporting are written in codes. However, thousands of SAS programs or codes have become data ubiquity that makes the generalization and reuse of the programs harder in an organization. Whether the knowledge of the best programming practice of each individual programmer can be captured, retained, transferred and shared will be dependent on how the programs are designed, organized, documented and become institutionalized. Good sample of programming practice such as codes written with explicit comments in each of its modules and generalized to be applicable for re-use, and optimally standardized as automation process. There are still a lot of industry or programming related knowledge are tacit, individual, internal, or project specific that need to be transferred into written, explicit, corporation-utilized, and externalized assets.

Particularly, with the situation of the employee’s turnover or the companies’ merger, the management of programming eagerly wants to capture and retain the departing person’s experiences on programming and projects, to absorb two bodies of knowledge and expertise from previous companies together.

This paper is a brief study that crafts a knowledge management strategy for SAS programming. The study consists of the objectives, the methods to support the knowledge management strategy, the plan to implement the strategy, and measurements and technology to improve the knowledge sharing and decision making in order to increase the SAS programming value proposition in the company.

OBJECTIVES

Being a SAS programmer is a unique experience that requires the combination of knowledge of financial, or pharmaceutical or other industry and SAS programming. There are tremendous benefits to develop a knowledge management strategy in SAS programming group for the company to retain, transfer and make use of the SAS programmers’ knowledge and expertise of both industry and programming. The primary objective of the knowledge management strategy is to identify the needs and opportunities, to establish the disciplines and rules, to set forth the measurements for evaluating the KM results, in order to convert the individual knowledge into institutional knowledge, to generalize ad hoc codes to minimize the effort in the future, and to transfer historical or indirect knowledge into organizational knowledge, so to deliver the prompt and quality results, and finally to achieve the best productivity and effectiveness.

SAS programming group in a company is considered as the center to collect, process, summarize, share and report the information and knowledge about data. It is very important for SAS programming group to have an effective knowledge management strategy to adopt and enhance the best practice to deliver the fastest and best quality outcomes from a variety of projects. The knowledge management strategy will help not only the internal experi-
ence/expertise sharing in the data analysis but also to provide the information and knowledge to the other business franchises in the company to accelerate the process from the R & D to market.

The specific objectives of SAS programming knowledge management are as follows:

- To explore problems or needs of knowledge sharing in SAS programming group
- To identify the existing knowledge and best practice of individual programmers, and to retain and transfer the past knowledge and experiences of programming designs and data analyses into company’s SAS programming process
- To foster good habits for each programmer to design a good programming strategy before starting writing the codes
- To establish good programming disciplines for all programmers in the group to follow
- To connect the individuals who have their unique strength with one another, to share lessons learned, and to avoid repeating the mistakes from others
- To accelerate the process from the research to the market to provide the best return for the various stakeholders
- To improve the quality of database, analysis and report, so to help streamline the production or decision making
- To develop the professionals, leading SAS programming group to become not just a number crunching machine or document filing clerk group, but also a Center of Knowledge

CHALLENGES FOR SAS PROGRAMMING MANAGEMENT

It is commonly seen in past two decades that programs became ubiquity meaning hundreds thousands of codes are available everywhere as being developed over the time. The problem is now how to use them. There are prominent needs for SAS programming group to establish the best practice based on the lessons learned and to apply the best practice to support the company’s business opportunities more efficiently and effectively.

The Needs to Convert Individual Knowledge to Organizational Knowledge

Every programmer is an expert with a lot of skills and experiences. For some quite of times it is easy for them to become the “lone hero” in their own due to the lack of collaborative efforts to share the knowledge and experience between the programmers with different levels and different aspects.

To Build Best Practice Such As Documentation and Generalization of Programs

There were many programs or codes are written in a quick at hoc style that will be difficult to reuse later. Some programmers created programs without providing any documents or comments that will make the later programmers including the original author feel lost in the codes. Some other programmers generated codes just too project specific that would be impossible for people from other project to use.

To Share Knowledge Between Programmers and Other Groups

The knowledge sharing and learning among programmers need to be improved. Some programmers wrote programs in stored macros with access being blocked, or created codes unnecessarily complicated that others could not follow its logic, because they fear their job is less secure if their knowledge shared. It is not a surprise that the ways the programmers were coding and their practice in doing projects are not the same. But management wants to make sure that the right and most economic approach is being retained and integrated into the best practice in the organization. A culture of knowledge sharing and learning has to be cultivated.
To Avoid Repeating Mistakes from Others  Mistakes do happen in any research and development process. Programming design problems, data issues, or analysis errors occur throughout the process. A mistake that is new to one could be the repeat of others if the knowledge is not shared with others. With a group and more lessons learned, the programmer should be able to avoid repeating mistakes by sharing the knowledge and experience.

Tacit Knowledge Need to be Captured and Transferred for Sharing and Communication  There are enormous amounts of tacit knowledge from both individuals and the group that are not formally documented in the standard procedure. With the retirement and turnover, these competitive knowledge could be lost.

METHODS AND MEASUREMENTS

In order to meet the business needs, programming group is required to support the company’s strategic plan. To aid in their decision making for the executives to fulfill the objectives, programming knowledge management initiatives can provide methods, resources and measurements utilized in a phased approach towards the maturity of knowledge sharing and integration.

Top-Down and Grassroots Combination  All employees in the programming group are well-trained and experienced professionals. They should not be considered as only the recipients but also the contributors to the knowledge management system. They are encouraged to have a sense of ownership.

Define Specifications  It is very important for all programmers in the group to share the definition or specification before they start any new projects. If the programmer has any questions about the project or request, write the specifications to confirm it.

Set up Standard Environment  For programmers to share the same data, programs and produce the results in the same format, the standard libraries, directories, formats and titles/footnotes have to be set up.

Build List of Validated Programs  Check out all actively used programs and create a listing for record. All programs in the listing should be validated before being used in the projects.

Standardize Programs  Make commonly used programs generic for them to be shared with other projects and programmers. Most of standardized programs can be generated in macros for user to call. This can be done at least for standard data analysis reports. Optimally the standardization can automate the process as much as you can.

Low Maintenance Needs  Modify the programs to require only low maintenance needs. The programs for lengthy process should be built in staged routines with changing parameter options. In this way, the programs can be reused with little changes.

Build Programmer Community  The SAS community can be built for all programmers in the forms of forum, e-community, symposium, space and expert locator system for sharing the skills and knowledge. The community is equipped with the standardized applications, tools, and database. The involvement and contribution in the community will be taken into consideration of employee’s annual review.

The measurements will be used to measure how programming knowledge management will support the business strategy. As the knowledge can be explicit or tacit, the measurements can be hard or soft. Also, the results of process can be tangible or intangible.

- The time saved in the process of data mining and analysis to shorten the interval from project initiation to completion
- The average reduced number of data issues or discrepancies queried in projects to improve the quality and efficiency
The number decreased in process rework
- The career and professional development
- The number of projects completed weekly, monthly or yearly
- The number of clinical studies approved by FDA

COMMUNICATION AND REWARDS

It is very important for senior management to communicate to all employees to change their behaviors. The programming knowledge management will not only change the technology but also cultivate the culture. If, in the past, there might be some distrust or even finger pointing between the groups or people, now with this new organizational culture the employees become not only the believers but also the promoters of the knowledge learning and sharing.

The executives will provide the following communication to the employees:
- The education of principles: the knowledge hoard behavior will be prohibited while the knowledge sharing will be required
- The connection for people and groups to each other
- The performance evaluation of managers and employees including knowledge learning and sharing
- The reward of contribution to knowledge sharing and expertise system

Through the communication the vision will be shared among the employees, and the trust will be built between individuals and groups. Each employee will have the ownership meanwhile having responsibility. All individuals, project teams and function groups are obligated to teach each other, and shared any lessons learned. The consequences are more than measurable results. The knowledge become catalyzed synergy of innovation, time saving and profit generation.

Both managers’ and employees’ performance review will include the evaluation of their effort of knowledge learning and sharing. The significant contribution by any individual to knowledge learning and sharing will be rewarded. At a result, the culture of knowledge learning and sharing will prosper in programming and other groups. The desire of knowledge sharing will grow stronger as its value of business continues to increase.

CONCLUSIONS

The knowledge management will provide the base for the best practice in SAS programming. With the best practice, the SAS programming will be the center of knowledge and excellence in the company.

ACKNOWLEDGMENTS

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NESUG 2009