

How do we ensure the programmers we have today will meet the business needs of tomorrow?

Christine Leigh, Karen Rowe

Roche Products Ltd, Welwyn Garden City, UK

The company expectations of our programmers are evolving, driven by changing business, economic, technological, and regulatory environments. The drive to increase efficiency, work globally, be innovative, and still deliver quality has meant that both the roles of the programmer and the manager are changing. Programmers are now expected to have an extended range of skills both technical and soft to enable them to be an active participant in the drug development process. The manager plays a key role in setting the expectations and facilitating change needed to maximize efficiency. If we equip our programmers with the skill set to take on change and managers with a tool kit to support change, we create an environment in which innovation can flourish, the company benefits, and individuals feel valued. The benefit to you is a motivated, multi-skilled programmer who is equipped to meet the ever changing environment that we face.

Keywords: Development, Programmer, Learning, Motivation, Management

Introduction

As our business evolves, so does the programming environment, with this, expectations of programmers and managers change. Programmers are required to develop new skills and managers are faced with developing a diverse group of programmers with different skills, strengths, and motivational needs. The paper will focus on why the landscape is changing and how we can use various tools available to us to support and develop programmers to ensure that business needs are met both today and for the future.

Why Have Expectations of Programmers and Managers Changed?

The pharmaceutical business, like others, has needed to constantly evolve. The drive to improve efficiencies, implement cost-effective solutions, and meet a changing regulatory environment has seen every function within the organization analyse the value that they provide. Innovation, blue sky thinking, flexible working models, and eliminating non-value tasks are hot topics on every pharmaceutical agenda.

We now also work in a truly global environment, not just our global market place but seeking areas of the world where new resource can help us succeed.

This has meant an increase in working with remote and virtual teams. Today each employee within the pharmaceutical industry is invited to take part in change and even drive change to meet new challenges. For statistical programming, it is no longer sufficient to think just about producing code; the value is now about combining technical and analytical skills, together with business knowledge and experience of our most powerful asset, the data. This effective combination will enable programmers to deliver fast, efficient, and cost-effective solutions to our stakeholders. For many of our programmers, this is a powerful change in mindset. The evolution of our industry will continue and the development of individuals should always sit in parallel to change.

In order to meet the challenges, programmers are now expected to have an extended range of skills both technical and soft, to enable them to be an active participant in the drug development process. As the expectations of our programmers change, so do the expectations of their managers. Managers need to guide development in a range of skills and broaden everyone's skill set using different methods. This can often pose a challenge and can demand much from the manager. Individuals often do not see the need for development unless technical, some individuals identify traditional training courses as the only way to take on new skills and more recently, we see the rise in individuals, particularly students joining the industry looking, to the use of social learning and

Correspondence to: Christine Leigh, Roche Products Ltd, 6 Falcon Way, Shire Park, Welwyn Garden City AL7 1TW, UK. Email: christine.leigh@roche.com

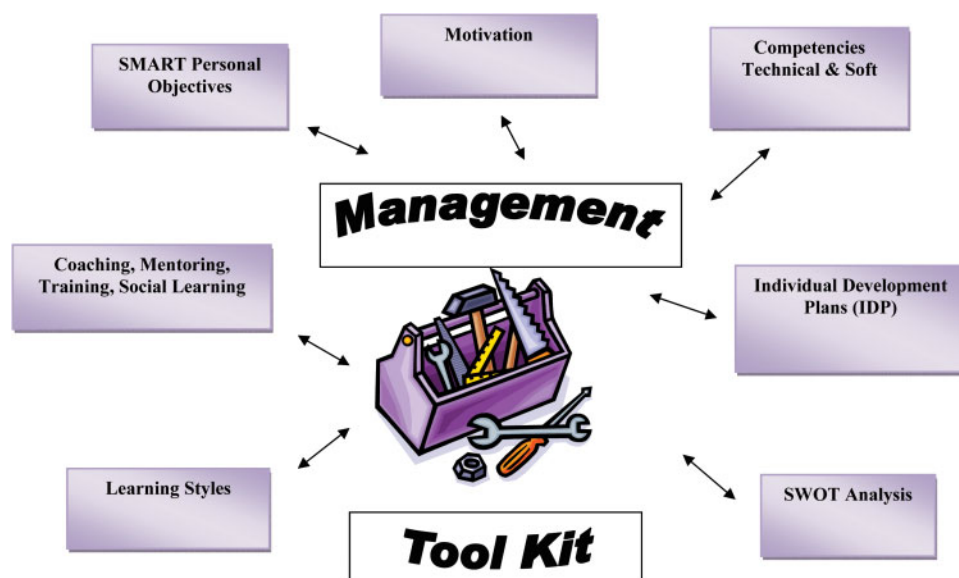


Figure 1 Management Tool Kit

new methods of development taught in schools and university.

What Tools Are There to Support the Manager to Develop Programmers to Meet the Changing Environment?

There are many different management theories and tools available, but it is often a challenge to decide which to use and how best to apply these in the workplace. As a manager, we recognize that people are different and there is a need to equip ourselves with a management tool kit to support change and identify ways, which can practically be applied in the workplace. We will look at different elements of our proposed tool kit (Fig. 1) and then describe how these can most effectively be combined to drive the development of a programmer. Whether the development is technical, analytical, or a soft skill, the tool kit can be applied.

The following sections will cover methods used successfully to identify individual learning styles, the use of Specific, Measurable, Achievable, Realistic, and Time bound objectives, why motivational profiles can support development, the use of competencies, the creation of an individual development plan, and how analysing strengths, weaknesses, opportunities and threats can aid the development of individuals. The key aim of using this tool kit is to ensure that we target effective learning and development.

How Can We Understand Our Programmers Learning Needs and How Will This Help a Manager Support Their Development?

There are many different assessment tools that can be used to identify a person's learning needs, learning styles, or preferences, two of the best known are VART¹ and Honey and Mumford.² These tools help

us understand what someone needs to learn and how they learn best.

The VART (Fig. 2) questionnaire will enable you to assess a learning style preference.

Visual learners like to see demonstrations and learn best from visual displays such as diagrams and pictures. They use body language and facial expression to help understand and like to use lists to organize their thoughts. They like illustrations and presentations that use colour and usually take detailed notes to absorb the information.

Aural learners learn by listening. They explain things well and like to participate in discussions. They can recall in great detail what they have said in a meeting and they remember things better through listening rather than reading. They like to talk and work out problems by discussion.

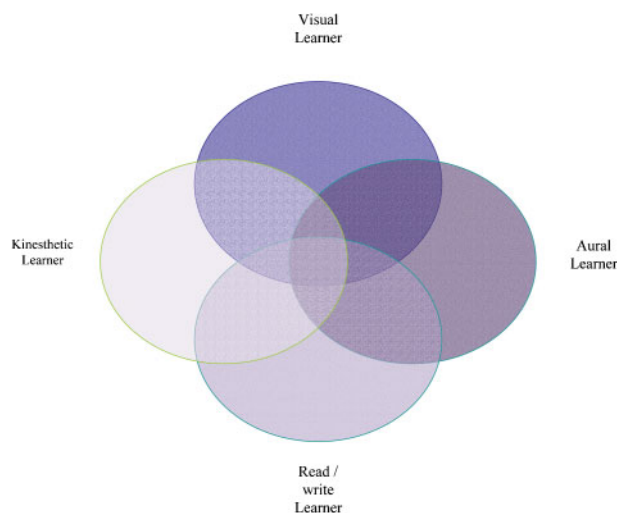


Figure 2 VART Learning Styles

Read/write learners are note takers. They work best in quiet areas and prefer to learn by themselves without distraction. They do well with hands-on tasks and like a lot of detail and information.

Kinesthetic learners learn best by doing. Their preference is for hands-on experiences. They like to get involved and formal training courses do not suit them. They often have high energy and process new information best when it can be touched.

People may have a strong preference for one category or have a mixture of styles. Understanding an individual's learning style preference can be used to guide the manager's choice of learning when working with the individual. For example, if someone has a high score for reading and writing, it may be sensible to consider options such as self-learning as a support for development and ensure that the learner has time to assimilate new learning's through reading. The individual's preference in this example is then effectively utilized in development. Someone who has a high kinesthetic score may benefit by hands-on experience as their way of learning.

An alternative method for assessing learning tendencies is Honey and Mumford (Fig. 3). This questionnaire focuses on general behavioural tendencies. Honey and Mumford suggest that people prefer different methods of learning depending on the situation and their experience, so they move between the four modes of learning. This questionnaire is based on the cycle of having an experience, reflecting on it, drawing a conclusion, and putting the theory into practice to see what happens.

For example, if the individual is defined as an activist, then incorporating some role play into a coaching session may work well as this type of learner likes to be hands on and learn from their mistakes.

By understanding an individual's learning preference, the manager can use this to support development

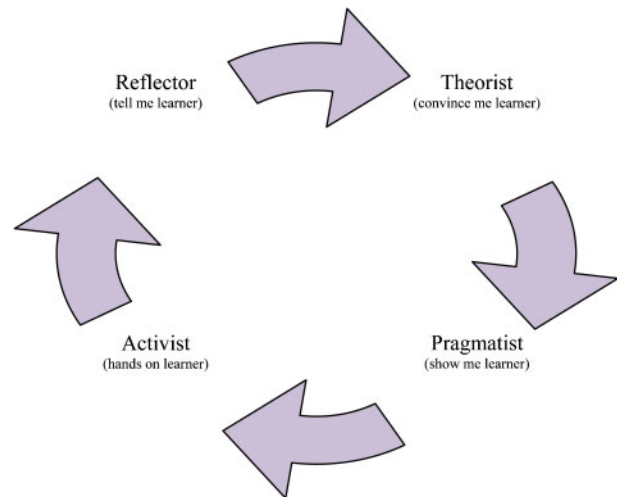


Figure 3 Honey and Mumford Learning Styles

by choosing the most appropriate approach to learn. Some of the possible choices are:

- coaching;
- mentoring;
- training;
- self-learning;
- social learning.

Understanding how people learn provides a good foundation to build development, but for effective workplace development, it is important to agree appropriate learning outcomes. Outcomes need to be clearly defined and agreed between the manager and learner, and written in a Specific, Measurable, Achievable, Realistic, Time (SMART) format so that it can be ensured that the objectives are unambiguous and reasonable. Setting objectives is important, and it provides focus and can motivate individuals to meet the objectives set.

An example of a task-based objective might be as follows (Table 1):

Table 1 SMART Definition

SMART meaning	Example
Specific — Objectives should specify what they want to achieve	Successfully lead programming activities of study xx1234 and meet timelines for delivery of quality outputs by 31 December 2011
Measurable — You should be able to measure whether you are meeting the objectives or not	Outputs delivered by 31 December 2011. Feedback on process from team and manager
Achievable — Are the objectives you set, achievable and attainable?	Work planned and sufficient resource to achieve timelines
Realistic — Can you realistically achieve the objectives with the resources you have?	Sufficient resources available to achieve the task
Time — When do you want to achieve the set objectives?	31 December 2011

How Can We Understand What Motivates an Individual and How Can Understanding This Help Support Their Development?

A key support tool for successful development is understanding what motivational needs a person has. This will vary between individuals and most people will have a mix of motivational needs determining how they are motivated and how they motivate others. There are a number of assessment methods that can be used to identify motivational type.

Some theories such as that proposed by David McClelland³ say that motivational needs can be broadly classified into three thought worlds. First, thinking which has to do with goals, tasks, improvements, success, and failure is called Praxis or achievement motive. Second, thinking that has to do with relationships, teams and friendship is called the Patria or affiliation motive. Third, thinking that has to do with influence, leadership, emotion, and control is called the Protos or power motive.

Most people have one motive higher than the other two; a motive profile is the balance of the three motives which are established by adulthood, and can be managed effectively but rarely changed permanently. Understanding and managing an individual's motives can help guide the development for an individual. Different tasks require different motives. To do the job well and with satisfaction, personal motives must match job motives. By understanding the different thought motives, managers can motivate the individual and build their development through areas in which they can flourish.

Individuals motivated by task will thrive when tasks are clearly established and will gain a sense of achievement through completing tasks and ticking them off the list. They are motivated by the sense of accomplishment and are driven by results. Achieving the task gives greater personal satisfaction than praise received.

Individuals motivated by people, are driven by establishing friendly relationships and motivated towards interactions with other people. These individuals need to be liked and held in popular regards; these people are great team players. Dominant patria players need affiliation and team work. They will not perform well on their own but will be more comfortable in the company of others, doing their best work when they feel part of a group.

Individuals motivated by influencing, are driven by a need to make an impact; they have a strong need to lead and to move their ideas forward and they also like to increase their personal status.

Most individuals have a combination of these motivational needs. Some have a strong bias to a particular needs; the mix of these needs affects behaviour and working styles. Understanding individual's motivational needs can help managers determine how best

to manage and motivate an individual to develop and why having a strong bias to one motivational need might explain certain behaviour.

If an individual has a strong tendency for interaction with people, this may influence their ability to make decisions as they are driven to maintain relationships. Someone driven by influence will be attracted to leadership roles, but may not have the required flexibility required and people skills. Individuals driven by tasks will achieve their goals, but may demand too much of others because they prioritize achieving the goal above needs of others.

When managing individuals, the manager may often need to move between the different thought worlds to motivate a person. If an individual has a strong bias for a certain need, then the manager may need to focus on that style to get the best from the individual.

For example, if you manage an individual who is strongly motivated by tasks and influencing, the following request may not motivate them: 'Make all programmers aware of the new features of SAS9.2 graphics at some point this year'. Rephrasing this request with tasks and influencing in mind, you could say 'Present for 20 minutes on the new features of SAS9.2 graphics at the next global meeting on 1st November'. By rephrasing the question, we have added detail and timelines to appeal to the 'task' motive and the invite to present globally to colleagues to appeal to the 'influencing' motive (and increasing personal status by raising that persons profile). By simply relating the motivational needs to the request for the same activity will help get the best from that individual.

What Part Do Job Level Competencies Play in an Individual's Development?

Competencies for programmers will be driven by both the company expectations and the individual's role and will cover both soft and technical skills. Competencies can be used to support the career development of an individual and also identify gaps that then drive the development of an effective development plan. Competencies affect a major part of the individual's role and responsibilities, and can be used to assess performance on the job. They provide a measure for assessment and can be improved via training and development.

The company may set high-level company values and competencies that then set the foundations for the competencies of the individual role. Each role will also have specific competencies based on the functional requirements of the role.

For a programmer, job level competencies are important and should broadly cover areas such as technical knowledge skills and their application to the role, analytic ability, project management, leadership, communication, and knowledge of the industry. Detailed competencies will enable the manager and

Table 2 Competency Example

Competency	Level 1 programmer	Level 2 programmer	Level 3 programmer
Planning and prioritizing	Communicates obstacles and informs completion dates to project lead	Works on multiple tasks and meets timelines. Demonstrates ability to prioritize	Breaks down deliverable into work tasks that can be delegated to other members of team. Prioritizes and delegates tasks and develops timelines
Production of Tables, Listings and Graphs (TLG)	Produces raw datasets and standard TLG	Produces derivations and non-standard TLG	Produces value added datasets and complex TLG

individual to clearly assess themselves and will guide the individual in the next step for development. The competency set will also ensure individuals are clear on the expectations of their role and are performing effectively at their current job level.

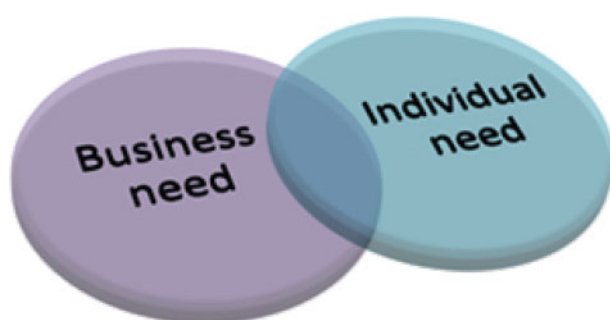
By using the competency framework, areas for development can be identified and expanded upon in the individual's development plan as well as ensure consistency across the department in terms of expectation of roles.

An example of a soft and technical competency can be viewed in Table 2.

What Is an Individual Development Plan (IDP) and How Can It Be Used to Support an Individual's Development?

The individual development plan is a key tool to developing individuals. The most effective use of this as a tool is when it is created, driven, and owned by the individual. The role of the manager in this process is firstly to ensure that individuals understand the benefit of a plan and then to initiate and engage in the development discussion with the employee. Often the plan is difficult for the employee to achieve in isolation. Where possible, the development plan should align organizational need and individual aspirations. It is key that the manager is clear on the expectations that the business has and the expectations of the role.

Often there is a misconception that development plans are for those who do not perform as the business expects; however, development plans are for everyone (Fig. 4)! Everyone can and should develop and build

**Figure 4 Business and Individual Needs**

on skills. Development plans can be initiated at any time; the start of the year is often preferred and then evolves as a living document. Remember that the discussion is the key component, and often people are put off by the formulation of development, so this may be a hurdle to a good IDP. The benefit to the employee is the constant knowledge that the company wants to develop them and sees them a key component in the business, this is also a key opportunity to identify their career and development aspirations. For the employee and the manager, it is a way of clearly identifying strengths and development opportunities that can be aligned with the business. Often the development plan is a way of making people step back and focus on their own development. Individuals are different; some individuals have clear focus on development, whereas for others, the IDP is a helpful tool which enables them to structure their thoughts. It is important to emphasize that development should not always be thought of as upward progression but can be a broadening of knowledge or a skill set.

As a manager, we can use a number of tools to create a development plan. One particular tool is SWOT analysis (Fig. 5) where we can focus the individual to assess their strengths, weakness, opportunities, and threats. Strengths are the individual's positive attributes which they have control over, weaknesses are negative attributes which they have some control over, opportunities are uncontrollable

**Figure 5 SWOT Analysis**

Individual Development Plan		
Name	Tom Amil	
Date of Assessment	10th January, 2011	
Status (Draft or Final)	Draft	
Career Aspirations	Gain more experience in a leadership role in order to progress to the next level	
Identified Development Area (including timeframe)	Development Area (SMART) Actions (for this year)	Results/Comments
Build on leadership skills	s: lead programming activities for study xxxz12 m: produce timely and quality delivery of outputs a: achievable within current project resourcing r: In line with career aspirations t: complete delivery by Dec 2011	
Employees comments:		
Manager comments:		

Figure 6 Individual Development Plan

external factors that can be potentially used to their advantage, and threats are uncontrollable external factors that may work against them. Looking at the quadrants together can be a creative way to think about where individuals are in their career and the directions they could take.

The development plan can take any format: above is an example of an IDP (Fig. 6) which will help the individual focus on areas of development and SMART objectives to ensure that the development is achievable. The IDP can help focus individuals on short-, medium-, and long-term objectives to meet their career aspirations.

Conclusion

If we equip our programmers with the skill set to take on change, we create an environment in which innovation can flourish, the company benefits, and individuals feel valued. The benefit to you is a

motivated, multi-skilled programmer who is equipped to meet the ever-changing environment that we face.

Acknowledgements

We would like to thank Katherine Macey for her review of this paper. All views expressed in the paper are those of the authors and not necessarily those of Roche Products Ltd.

Brand and product names are trademarks of their respective companies.

References

- 1 VARK. Available from: <http://www.vark-learn.com/english/index.asp>. [Accessed August 2011].
- 2 Honey and Mumford. Available from: http://www.sos.net/~donclark/hrd/styles/honey_mumford.html. [Accessed August 2011].
- 3 David McClelland Motivational Theory. Available from: <http://www.businessballs.com/davidmcclelland.htm>. [Accessed August 2011].

Copyright of Pharmaceutical Programming is the property of Maney Publishing and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.