Chapter 6 – Transfer Model

6.1 Newly Proposed Model

The aim of the model described in this chapter is to introduce the basic activities involved in a technology transfer project. The model can be used in a formal technology transfer strategy from the early planning stages through the measuring of progress and output of the project, to the post review of the project.

The following model is proposed for describing the process, from need identification to using the technology. For the purpose of the model the following step are identified:

1. Identifying the need
2. Searching/Developing the technology
3. Evaluating the technology
4. Transferring the technology
5. Customise technology
6. Implement technology
7. Manage technology

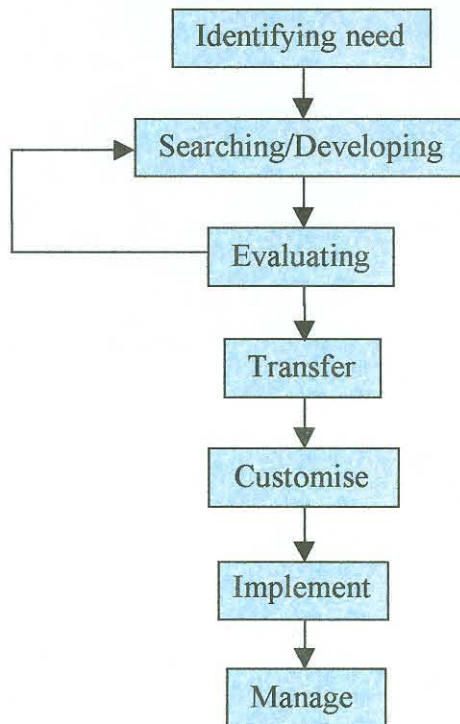These steps are indicated by the following flow diagram:

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                    ┌──────────────────────┐
                    │   Identifying need    │
                    └──────────────────────┘
                               │
                               ▼
        ┌─────────▶ ┌──────────────────────┐
        │           │  Searching/Developing │
        │           └──────────────────────┘
        │                      │
        │                      ▼
        │           ┌──────────────────────┐
        └───────────│      Evaluating       │
                    └──────────────────────┘
                               │
                               ▼
                    ┌──────────────────────┐
                    │       Transfer        │
                    └──────────────────────┘
                               │
                               ▼
                    ┌──────────────────────┐
                    │      Customise        │
                    └──────────────────────┘
                               │
                               ▼
                    ┌──────────────────────┐
                    │      Implement        │
                    └──────────────────────┘
                               │
                               ▼
                    ┌──────────────────────┐
                    │       Manage          │
                    └──────────────────────┘
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Diagram 6.1: Transfer process

Figure 6.1 depict, the technology transfer process as it moves through the individual stages of the project. The form of the graph is assumed and determining the exact form of the graph may be the subject for further study. The blue line in figure 6.1 indicates the cumulative progress of the transfer process over time. The blue dotted lines indicate the progress of individuals or groups. There is a certain element of noise involved in the transfer process as illustrated by the magnified portion of the blue line in figure 1. The noise consists of external factors, which have an effect on the process. This includes factors like company culture that is not geared towards change, poor information flow and poor communication.

The first step of the transfer process is the identification of the need. With the identification of the need one actually defines the desired output of the system. The system in this case will represent a technology or technologies
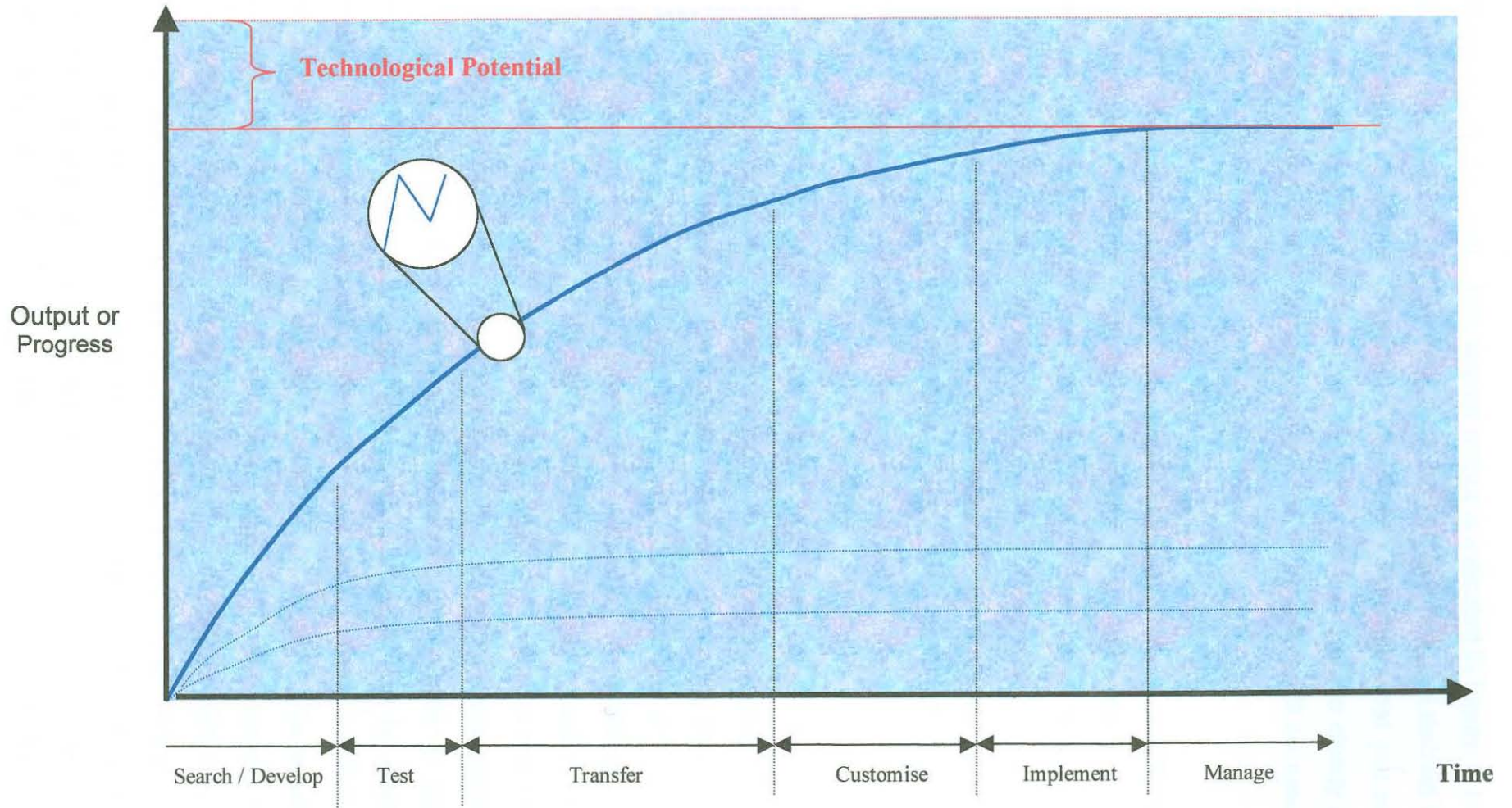
Figure 6.1: Technology Transfer Model

that will satisfy the need. The desired output is indicated in Figure 6.1 with a red line. The main aim of the system will be to reach this goal defined by the desired output as fast as possible. The red line indicates what you want to do, what need you want to solve. In this step it is important to clearly define the objectives and specifications, because the whole effort will be measured against it.

The first effort in the process of identifying the need is searching and identifying potentially appropriate technologies that will satisfy the need effectively. These technologies may be found internally or external to the company. Any of the sources mentioned earlier in this paper should be used, in order to find the most appropriate technology. The company may also opt to develop the technology themselves, if they have access to the relevant resources like a R&D laboratory.

The third step is evaluating candidate technologies. The candidate technologies should be evaluated according to the clearly defined objectives and specifications defined in the first step. It is now clear why this was such an important step, defining the objectives and specifications of the system. As illustrated in the flow diagram, this step has a feedback to the search/develop step. This is due to the fact that this is an evaluation step and the technology may not be suited to the application. Therefore one must go back and do a further search for more applicable technology. It is important to note that if you have to go and search for technology in order to satisfy a need, the need is probably unique and a technology will not be developed specifically with your application of it in mind. In short you will look for a technology with the best fit, one that would satisfy most of your needs, and one that is flexible enough in order to be customised to one's specific needs. The evaluators of the technology must keep in mind that the technology itself is dynamic and there might be future developments in the technology. There is thus a potential for improvements in the technology. This may have an effect on the application of the technology. For this reason the potential technological development is indicated in figure 6.1 by the red dotted line.

The red line that indicates the technology level that would satisfy the need may even be a sloping line with positive gradient due to the fast development in the technology. The personal computer (PC) industry is a good example. If you want to develop a programme for a PC application, do you develop it for the current state in PC performance, or do you develop it for the performance in a year's time. The most important point is selecting a technology in which the potential development will benefit the application of the technology.

The fourth step is getting the technology into the company i.e. transferring it. This can be done via several mechanisms already discussed. The transfer can be in the passive mode or active mode, the active mode being the mode where a third party is involved in helping with the transfer process between the developer and the user. In this step, not only do the physical (hardware) components of the technology enter the user domain, but the training of the resources commences.

In the fifth step the technology is customised to the users specifications and liking. The technology is tweaked in order to satisfy very specific needs of the user defined in the first step of the transfer process.

During the sixth step the final implementation is completed. In this step all the resources that will be using the technology are introduced at their respective levels. This is also the step where the new technology is being used for its intended purpose. If the technology replaces older technology it often runs parallel to the older technology while its operations are scaled down. The training is completed during this step and any initial problems are solved.

The seventh and final step lasts for the rest of the life of the technology. In this step the technology is managed over the rest of its life. Not only is the technology managed, but also the resources using it. Several aspects that are looked at from a management's perspective include:

- Incorporating improvements in the technology
- Monitoring competing technologies
- Monitoring the fitness of the technology

Management of the new technology should include the monitoring of improvements in the technology and the incorporation of any improvements, if it is beneficial and relevant to the application. Any improvements identified by the users of the technology should also be considered. These improvements are very often incremental as opposed to the drastic changes during the implementation phases.

The second point is the monitoring of competing technologies. Because technology can give a company the competitive edge, competing technologies may pose a threat. Such technologies should then be considered to succeed current technology. The last point is the fitness of current technology. The question should be asked whether the current technology is still able to deliver what is expected of it.

The final managerial task, after implementing the new technology, is to assess the success of the transfer process. In order to do this the project should be evaluated according to the objectives and specifications defined in the first step of the model.

It is clear that in this final step, which lasts for the rest of the life of the technology, different management principles are used as opposed to the first five steps in the process. In the final step, general management principles are used to manage the technology from day to day. In this phase the technology is used, while in the previous steps the technology was being implemented.

6.2 Conclusion

This model serves as a starting point to the introduction of a formal technology transfer project. The model can easily be customised according to each project's needs. It also serves as a handy management tool to people involved in technology transfer projects. It is important to note the difference in the managerial aspects during first six steps and the last step. In the first six steps project management principles are used while in the final step general management principles are used.