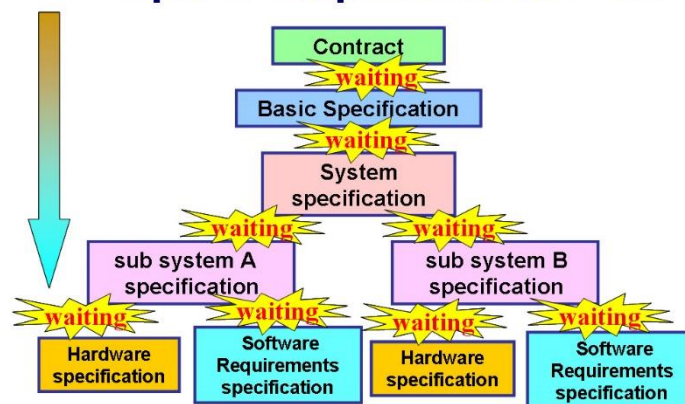# Reducing development Lead Time by using QFD
Quality Function Deployment

The Rational

When analyzing the reasons for delays in product development programs, we discover that the main reasons are linked to the requirements. Not being aware of the value to the customer; misunderstanding customer needs and priorities, waiting for requirements, looking for information and so on. It also causes many redesign cycles that create delays in the product development process. This paper will show how that by implementing QFD practices during the development process, leads to reduction in development cycle time.

Quality Function Deployment (QFD) methodology

QFD is a systematic approach for motivating a business to focus on its customers. It is a structured process which defines customer needs and requirements from the "voice of the customer" point of view. It is used by cross-functional teams to identify and resolve issues involved in providing product value to satisfy the customers. The QFD links customer needs with the development team. It means understanding: value to the customer, customer needs and Customer Requirements and priorities. It helps organizations seek out both spoken and unspoken needs, translate these into actions and designs, and focus on it during the development life cycle.

Value to the customer

Value to the customer is defined as the ratio between the benefit he receives and the price he pays. In order to define more accurately value to the customer, we have to fulfill the following needs:
- Solving customer problems
- Exploiting opportunities

- The product should look good
- The Customer should feel good

We should deeply understand those issues before we are dealing with the details and requirements. We must well understand the customer needs that represent his world. We must know his priorities and focus on the operation that will give the customer maximum value. The QFD methodology helps us to focus on supplying value to the customer by:

- Looking for needs, spoken and unspoken
- Converting those needs to measurable requirements
- Evaluating ways for implementing those requirements
- Focusing on the activities through the development process to ensure proper implementation.

QFD workshop

The purpose of the QFD workshop is to capture the voice of the customer in a variety of ways to provide value to the customer. It is based on a very effective method, which replaces large, complex tools such as the House of Quality with smaller, faster tools that deliver the major benefits with a better focus on critical customer needs. The workshop is a concentrated effort of selected team members to achieve a step function of understanding customer value and requirements. It also uncovers many issues whose resolution will lead to a more complete specification. The most effective time for implementing a QFD workshop is in the early design stages. In those stages, there is not enough information, but the most important decisions have to be taken.

The QFD workshop has three components:

- Multidisciplinary team
- QFD tools that relevant to the workshop
- Workshop facilitator

The workshop itself takes about one day and is divided usually into three phases:

- Identifying customer needs
- Converting those needs to requirements
- Evaluating ways for implementing those requirements
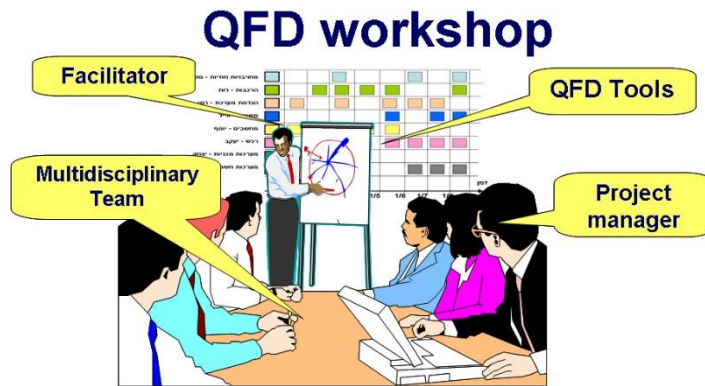- Developing and allocating those requirements to the project team

There are dozens of QFD tools that can be use during the workshop. It needs a lot of experience to identify the tools or combination of tools adequate to the specific workshop. The QFD tools cover the following areas:

- Understanding value to the customer
- Exploiting customer needs
- Deriving and consolidation of the requirements from those needs
- Prioritizing those requirements
- Allocating requirements to the project team
- Requirements development and elicitation

- Evaluating ways of implementation
- Analyzing system operations and scenarios
- Selecting the proper configuration for the customer

The QFD workshop is effective in the following stages:

- Preparing a tender for the customer
- Understanding the needs and requirements after winning the contract
- Allocating the requirements to the development teams in the preliminary design phases
- Elicitation and developing the requirements during detail design phases

Customer Maximum Value Workshop

This is one of the basic tools that focus on the top few customer needs that provide the maximum value for the customer. In this workshop we exploit not only what he needs, but most of all the way he needs. Most of the customer's segments that are involved in the product definition participate in the workshop, system engineers, project manager and marketing. This workshop has several phases:

- Identifying and mapping all the customers
- Identifying the role of each customer
- Analyzing customers problems
- Identifying customers "dreams"
- Deriving customer needs

The purpose is to assure that we address the most important customer needs. Customer needs must be detached from the technical implementation, and must represent the customer world. This workshop eliminates or reduces to a minimum the redesign cycles that are caused by misunderstanding the customer needs and requirements. It also focuses the core of the project team to customer needs, which will guide them through all the development lifecycle.

Requirements allocation Workshop

In large and complex projects, which contain several sub systems, the process of allocating requirements to each subsystem is time consuming. It lasts a long time and requires many meetings and coordination. This is the time when the teams are waiting for information, or even worse, working on uncompleted requirements that lead to redesign cycles. The purpose of this workshop is to shorten the time from receiving the original specification till the point when the engineers can really start working. In this workshop participate: project managers of the sub system, the system engineers and the project manager. Each requirement is well understanding and allocated to the specific team. The outcome of this workshop is that the development team receives their relevant requirements, which enable them to initiate the detail design process.

Scenarios Mapping Workshop

When getting into deeper system requirements, especially for software peoples the system way of operation and scenarios must be described in detail. This detailed description is very time consuming because several system components are involved and there are many scenario steps. Further, there are several ways or configurations that can be performed for the same scenario. Therefore, this design phase can take an extended period of time and cause many redesign cycles. System engineers and software people participate in a Scenarios mapping workshop. In the workshop we map the scenario on a time line throughout all the relevant system components, and detail the function of each component. The mapping is done visually so that everybody can participate and provide his input and knowledge. Together we build an optimal configuration for each scenario. The end product of the workshop is a flow map for each scenario, and the role of each system component in that scenario. It provides sufficient data for the software people to initiate the software design. These workshops are very effective and can save months of ineffective meetings and reviews.

Conclusion

The System requirements issues are identified as the root cause for delays in project development. The QFD workshop enables us to design a product that is responsive to the voice of the customer, and at the desired time table. It is a simple visual tool that provides in a very effective way, a real picture of the requirements. It helps to uncover new information and focuses the team on what needs to be in the design. There are no other mechanisms or tools that can provide this benefit. A QFD workshop has to be conducted several times during a development lifecycle: at the beginning of the project, before PDR and before CDR. It reduces engineering changes caused by frequent requirement changes and leads to a reduced development cycle time and development cost.