

Problem solving

Unit 3 Employability and Professional Development HND in Computing and Systems Development



Learning outcome 4

- Be able to develop strategies for problem solving
 - Specification of the problem: Definition of the problem; Analysis and clarification
 - Identification of possible outcomes: Identification and assessment of various alternative outcomes
 - Tools and methods: Problem solving methods and tools
 - Plan and implement: Sources of information; Solution methodologies; Selection and implementation of the best corrective action eg timescale, stages, resources, critical path analysis
 - Evaluation: Evaluation of whether the problem was solved or not; measurement of solution against specification and desired outcomes; sustainability

Assessment criteria L04

- 4.1 Review tools and methods for developing solutions to problems
- 4.2 Develop an appropriate strategy for resolving a particular problem
- 4.3 Evaluate the potential impact on the business of implementing the strategy

Scenario

- You work as a security expert at a local e-commerce company and you are very concerned with its security. Your company has been trialling a security product which analyses internal networks and creates a report on the network activity every day. This information is stored off-site at a distant hosting provider. It does this by installing a rootkit on each local machine and needs to determine the default gateway on its own. Once the gateway has been determined, a connection is made to the distant hosting site and the data transfer can take place.
- You have noticed an increase in the traffic on the local network and have determined that a flaw in the code does not close the outbound connection but even worse, does not encrypt the outgoing data.

Specification of the problem

- Definition of the problem
- Analysis and clarification
- Einstein is quoted as having said that if he had one hour to save the world he would spend “fifty-five minutes defining the problem and only five minutes finding the solution”.

Steps to problem definition

- Make assumptions and then challenge them
- It is easy to jump to conclusions
- What do we think is happening to cause the increase in internal traffic?
- What is the significance of the open connection?
- Are the two related?

Steps to problem definition

- Don't get stuck solely with your own ideas
- Does anybody else have experience of this?
- Has it happened before?
- Is it happening to anybody else?
- Can you call on expertise?
- What does Google say?

Steps to problem definition

- Look upwards
- What is this a part of?
- What is the intention behind this?

Steps to problem definition

- Look downwards
- Go into detail
- What exactly is going on?
- What is affected?

Steps to problem definition

- Change perspective
- Apart from affecting you, who else is affected?
- What are they going to be worried about?

Steps to problem definition

- Get the details
- Exactly what is going on?
- What additional information can you get?
- What tools can you use?

Identification of possible outcomes?

- List your potential actions to solve the problem
- For each one determine:
 - The timescale (immediate, short term, long term)
 - Who is affected and how
 - The risk of not doing it
 - The impact of doing it
 - How it helps to solve the problem

Actions

- What actions will you take?
- How long for?
- How will that solve the problem?

What is the impact on the business?

- Immediate
- Medium term
- Long term
- Employees
- Managers
- Agencies
- Customers
- Suppliers

- For the given scenario
 - Say what tools and methods you would use to develop solutions to the problem defined in the scenario
 - Describe exactly what actions you would take to resolve the problem
 - Evaluate the short term, medium and long term impacts to the business

