

Applied Leadership and Management Outreach

Module Assignment Submission

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1. Definition of a complex problem in the workplace, including its scope and impact

1.1. What is the problem:

A complex problem in the workplace can be defined as an issue that involves multiple causes, affects several stakeholders and cannot be resolved through a straightforward solution. In modern organisations, the management of printers and paper supplies represents a surprisingly intricate challenge. It may appear to be a simple operational problem, but it becomes complex because it represents an intersect between technology, workflow processes and organisational resources. Therefore, the result of the printer and paper issues produce disruptions to productivity, increase cost and negatively influence employee morale and service delivery.

1.2. The scope and who is affected:

The scope of the printer and paper-related problems extends far beyond the physical device. They encompass the technical reliability and dependency of the workflow. From a technical perspective, printers often experience paper jams, slow processing speeds, failures to connect and outdated software drivers that impede efficient function. These issues affect employees who rely on printing for tasks, action and documentation. There is also the problem with inconsistent paper restocking, and a dependency on a robust consumables supply chain or repair/service engineers that creates delays and forces staff to pause their work. Employees may also misuse the printer, select an incorrect setting or print the document too large; these issues often lead to frequent repairs, paper waste and down time, which increase operational expenses and demand for IT support.

Complex problems arise that span multiple departments, levels of technology and link to IT infrastructure, finance (procurement costs) and legal compliance (shredding of confidential information for data privacy (GDPR)).

1.3. How are they affected:

The impact of printer and paper hurdles is significant and multi-faceted, invoking consequences that reduce overall productivity, as the employees spend time trying to rectify the printer errors and reprinting documents instead of their principal task. In the workplace, when such errors occur it impedes the efficiency of the workflow, deadlines may be missed as well as potentially affecting internal and external commitments or time-sensitive processes. In the retail business, printer function and efficiency is fundamental to key management operations if an issue occurs we get in touch with the maintenance department to repair the printer, though often at the expense of time delays. For example, a tedious paper jam can affect several key time-sensitive operations of the business such as printing documents, price tag changes, in store sales (receipts), staff bonus incentives, stock take inventory lists, daily business reports, interview sheets, end-of-night financial records, stock adjustment charts and individual employee store sales reports.

An example of this from a retail store is how management staff are responsible for processing all of the day's cash payments and managing two designated 'floats' which allow for the tills to remain balanced and standardised. For these tasks to be completed, banking forms are filled out for record keeping and cash deposits, these must then be verified and signed by a second member of staff for cash-handling compliance. The onus is on the management staff to ensure the

documents are completed and accurate for compliance and accountability, thus printer failures can create a situation in which staff are overburdened by finding alternatives that will still meet the required standard – especially during late evenings where purchasing more paper or calling out a printer service technician are not possible.

2. Analysis of information on the identified problem, to help inform the decision-making process

2.1. Brainstorming:

Brainstorming is one key technique used for problem solving and issue clarification. It is characterised by rational deduction of the root cause of an issue by considering multiple ideas and explanations, as identified by one or several people. There are many brainstorming techniques that can be used to collect ideas within group participants or just an individual. According to Wilson (2013), who describes 'brainwriting' with participants in a group who write their ideas on paper, which will then be read by another person who will then add their ideas. This is called a Brainwriting session, which is best held in groups.

2.2. Mind Mapping:

Mind mapping is primarily a thinking technique that organises ideas by demonstrating relationships and breaking down problems into distinct and manageable parts. This helps users to consider all of the aspects of a problem whilst also developing a multi-pronged solution.

Mind mapping is important according to Bates (2019), as it translates the brainstorming into actionable steps. On this mind map, you can demonstrate the connection of actions and outcomes in a way that helps you determine the most appropriate route of action. This is particularly useful when breaking down large piece of information or complex problems and finding innovative and effective solutions to operational issues across fields and industries. This approach was popularised by Tony Byson who was trying to find different ways to gain perspectives and gain clarity in problem solving practices.

Mind mapping is an easy way to manipulate complex information and issues as it working with how the brain intuitively solves problems but expands this to a physical resource that has quickly become a mainstream and used by many academics and businesses professionals alike.

Nast (2012) described a consultant from Michigan whose business has been running since 1992 and who frequently holds workshops in idea mapping, speed reading and other such techniques. The consultant directed Buzan centres in the USA and graduated from Purdue University with a BA in industrial management. She also published her book on Personal Excellence in October 1996. Principally, Tony Buzan who co-authored the mind map book (Buzan and Buzan 2006) who has demonstrated exemplary career success by implementing and promulgating the mind mapping technique which he still teaches today, 20 years later.

2.3. Identifying Root Causes

What are the root causes:

1. To solve the problem.
2. Benchmarking.
3. Continuous improvement.
4. Identify the root cause.
5. Collect the data of the root cause

These steps will help to identify the key progenitors of the issue, diagnose how they are best rectified and outline actionable steps for a sustainable solution (Andersen and Fagerhaug 2006). This will ensure the printer's reliable and sustainable function. The printer performance depends on its high-quality paper

print out and ensuring the reliability of the system for continual operational success. When problems occur, they must be addressed in a prearranged and efficient fashion. Two-tailed Ishikawa diagrams (Ciecińska 2023) ought to be utilised to highlight both the factors contributing to ongoing system functionality, as well as those factors which may produce errors or failures of the printing system.

2.4. Identify Root Cause via a modified '5 Whys' problem-solving technique

Ordinarily, the whys technique details the use of the 5-stage problem solving workflow, but this has been adapted for complex problems and encompasses mind mapping techniques and Ishikawa diagrams. The Ishikawa diagram is also known as the fishbone and was known to be used in sales departments and customer relations. The structure of the fishbone resembles a skeleton of a fish: The head contains the problem to be analysed. The spine contains 'main bones' which identify the categories of issues which contribute to the problem; on each main bone, 'sub-bones' indicate the 'whys' of this branch of the problem (Ciecińska 2023). These may be imbedded within a wider written and collaborative mind map.

Thus, to address the problem:

Step 1: Clearly state what went wrong, with all relevant details included; both colleagues and management staff should collaboratively use the brainstorming technique to generate a Ishikawa diagram for each derived principal cause to identify confounding factors.

Step 2: Ask the first 'why?' – For each principal cause, ask why the problem occurred, and record the answer.

Step 3: Repeat the question but answering in relation to the reason recorded for the first 'why?'.

Step 4: Repeat this process until the underlying systemic cause is identified, rather than simply at the 5th iteration, which may arbitrarily still demonstrate a symptom of the terminal cause. Notably, this underlying cause may even be identified before the 5th why.

Step 5: Depending on the complexity of the problem, as demonstrated by the mind map, there may be several principal causes that need to be resolved for the cessation of the issue; apply this process to each.

Step 6: Propose actions based on actual defects or operational causes identified by each avenue of the mind map following clarification of root causes by the above protocol.

3. Proposed range of alternative solutions to the problem

When a problem arises concerning the printer, it must be analysed and a record must be kept. Climate controlled conditions are important for the printer, so this must be kept in mind, it must not be too humid, or wet, or hot or cold. The set up of the paper should be easy to configurate and adjust. Any persistent issues, if not responding to conventional troubleshooting should be addressed by the modified 5 Whys problem solving technique described above.

4. Evaluation of a range of solutions

4.1. Options for the printer:

Based on pre-emptive analysis, we evaluate the options for the printer and paper to meet operational needs. High volume laser printers excel in speed, offering efficiency and durability; they are ideal for office environments with high printing demands. They offer a fast-printing time per minute and low maintenance duplex printing, ensuring smooth operation, good economy and productivity.

Colour Inject Printers are suitable for high-quality printing experience, with an excellent colour and quality feel but they have a higher running cost and are more suitable for low-to-medium printing volumes (Menya *et al.* 2018). Thus these are not suitable for large businesses and may be too expensive for smaller businesses where print quality, to such an extent, is not critical.

Multi-function printers combine printing, scanning, copying and faxing and are suitable for varied tasks; they generally are widely useful, but efficiency and reliability vary depending on the printer (Menya *et al.* 2018).

The premium quality paper despite its higher initial cost, is inadvertently cost-effective and suitable for everyday use, this is due to its compatibility with most printers and for a wide variety of applications (Menya *et al.* 2018). These premium quality papers have greater brightness, thickness and are very smooth which is ideal for reports or presentation, which in which poor quality paper may cause ink runs and damage company image in the eyes of stakeholders – costing more in the long run, this mitigates the concern of the higher cost.

There are also specialised papers which are water resistant and known for their durability (Menya *et al.* 2018). These printing papers are obviously thicker, higher

quality and more resistant to water and tear, but they require a compatible printer and the prices are not justified for their intended use in most corporate settings (Pingale and Altay 2025).

The conclusion of the above is that the choice of printer should align with the volume, the speed and quality requirements of the organisation's operations. For cost efficient printing, such as is most necessary for general retail and smaller businesses with a lower print demand - a laser printer with modest paper quality is recommended. Whilst the high-quality colour and efficiency of an inkjet or multifunction printer (with service contracts), with higher quality (but not specialist) paper would be more suitable for larger offices with medium to larger print volumes, and greater necessity for quality and reliable printing to ensure the most amicable fit for the business and with the greatest resistance to failure (Swartjes *et al.* 2017).

4.2. Regular Servicing

Prior to failure or incident, regular maintenance of printer should be scheduled with trained technicians who work with the IT department or are a part of them. Failures may occur due to outdated printer hardware/tooling, outdated software drivers, networks errors or simple mechanical or user error. Regular maintenance and dedicated point of contact minimise the risk of many of these fault points becoming live. Thus, it is in best interest of corporate efficiency to regularly book appointments with a service technician to maintain the printer to keep it in working order, replacing parts ahead of critical failures.

4.3. Staff Troubleshooting Training

Following rectification of a technical or mechanical issue by the printer repair technician, the record of advanced troubleshooting should be updated and made available to all employees. Furthermore, the employees could benefit from training and how to use the printer correctly if a paper jam occurs, they need to know not to forcefully pull the paper out of the printer and the best approach. For example, when staff are loading the printer with paper, they may need to make sure they fan and flex the paper first, their training and the troubleshooting should outline this. These steps will avoid printer issues in the first place and provide a robust method for remediation.

4.4. Problem Solving Technique Implementation

For any persistent issues, if not responding to the conventional troubleshooting above, they should be addressed by the modified 5 Whys problem solving technique described above in section 2.4.

4.5. Proposed Solution Cost Benefit Analysis

Item	Y1 Cost (£)	Y2 Cost (£)	Y3 Cost (£)	Y4 Cost (£)	Total by Item (£)
Software	700	0	150	0	850
Staff Training	550	0	0	0	550
Printer Servicing	300	100	150	0	550
Printing Paper	300	270	300	300	1170
Printer Fault Repairs	150	70	50	65	335
				NET Total	£3,455

5. Development of a detailed plan for implementing the solution

In this section, a Gantt chart will be produced to provide a structured timeline that may be used to rectify persistent printer reliability and paper management issues. The schedule identifies activities, responsibilities and problems that required for operational efficiency within the workplace.

See below a Gantt chart showing operational responses to printer issues:

Action	Description	Day 1	Day 2	Day 3	Day 4	Onwards
Flag Printer System Issues	Determine initial and wider points of contact as necessary, escalating only if significant effect on workflow or prolonged duration.					
Analyse Root Cause	Use aforementioned problem solving methodology (section 2.4) to determine root cause regardless of if the issue was easily fixed - to minimise recurrence.					
Escalation	If not simply fixed, refer to IT department who will attempt advanced troubleshooting; if unsuccessful, escalate to external expert technician.					
Retrospective Root Cause analysis	Depending on outcome, consider factors that may have led to the problem via the discussed problem solving method. Ask technician for their report - what do they think caused it? Human error, random failure? How can the risk be minimised in future.					
Recommendations	Depending on root cause findings, provide recommendations for next steps to reduce recurrence risk; this may be training, new paper/ink, an update to the troubleshooting guide or a more thorough service contract					
Implementation	Depedning on the extent of required steps, management may direct the steps taken to prevent recurrence. These should be discussed with colleagues and stakeholders to ensure they are beneficial, non-disruptive and practicable.					
Outcome Monitoring	Initiative leader ought to monitor the effectiveness of the solution through evidence such as cessation of down time as well as colleague and stakeholder input.					
Final Report	A final report should discuss the procedural shift in detail, what went wrong, how it was fixed, what the solution was and how sustainable and effective it is. These outcomes should be periodically monitored for continued efficiency.					

When errors arise with the breakdown of printing systems, it causes issues with productivity and operational workflow which must be addressed in a systematic fashion. Importantly printing system failures must be accurately documented for prompt action, troubleshooting and potential emergency technician call outs for

them to test the equipment and replace defective or damaged parts. It is always of best interest to keep the records of the issues relating to the printer, from which improvement plans can be produced. This kind of proactive incident management is key to ongoing success and remediation.

According to Sigma research shows that paper waste and material cost was caused by operational loss. Regarding production loss the quality reports and maintenance data was used to provide contextual insights for the root causes. Evidence shows that phase implementation yields a higher success rate than system redesign by enabling improvements and to adapt the learning stages.

The aim is to improve the reliability of the printer and paper management through effective communications and sustainable improvement and training plans. The Gantt chart provides a structured timeline to ensure all activities are completed efficiently, and aims are achieved.

6. Communication of the plan to relevant stakeholders

1. Conduct a stakeholder meeting (as necessary based on disruption likely to be caused).
2. Consult the employees.
3. Liaise with IT support.
4. Update the line manager.
5. Provide the final project findings.

To improve the efficiency of the printer systems and to reduce waste in the workplace, the employees must be aware of the advanced troubleshooting guides as well as the contingency plan to mitigate delays in the down time of printer systems until maintenance fixes the error. The wider and external stakeholders should be only advised of issues where there a significant project delays, for minor trouble shooting and tolerable delays, these are to be managed at the discretion of senior staff.

Unsurprisingly, the stake holders have interest in the performance of a company and should be informed of key challenges so they can best arrange their operations, they may also have contributions that would be valuable for decision makers (Gerrits and Edelenbos 2004).

The findings of the report of interactions by Le Tissier (2004) explain that the largest portion of stakeholder communication was by phone call or face-to-face meeting. Thus, as these are variably convenient for those involved, undue emergency meetings for printer errors may provoke annoyance or foster

disengagement. Hence, it is at the discretion of decision makers to determine the scope of how many people to involve in the rectification process.

Scores from 1 (poor) to 5 (excellent)pin.

Solution	Cost	Ease of Implementation	Reduce waste	Improves Reliability	Stats
Maintenance Schedule	4	4	2	5	2
Stock Monitor systems	4	3	4	3	4
Staff training	5	4	4	3	5

A decision Matrix has three solutions criteria's including cost, ease of implementation, effectiveness and staff training. The results show that staff training was the highest score. The Matrix helps compare criteria in decision making.

7. Assessment of appropriate monitoring and review techniques to ensure successful implementation of solution

7.1. The problem.

What to check: Was the printer and paper issues recorded?

Success: Were the issues completed by the stakeholders.

7.2. Staff feedback.

What to check: Did the employees provide actionable feedback?

Success: Being able to derive areas of improvement and solutions from the feedback.

7.3. Root cause

What to check: Has the root cause been identified?

Success: The main cause was documented and reviewed, with an action plan for resolution in the making.

7.4. Stakeholder consultation

What to check: Meetings took place with IT, management and staff.

Success: Stake holders informed and engaged, aligned as to the next steps.

7.5. Action plan

What to check: Did the management approve the proposed improvements?

Success: Approval received and processed.

7.6. Implementation

What to check: Were the agreed actions put in to practice?

Success: New procedures were introduced successfully and sustainably fixing the problem.

7.7. Staff training.

What to check: Did the employees receive guidance on the new procedures?

Success: The staff understood their responsibilities and expectations and were confident applying them independently.

7.8. Product review.

What to check: Are the tasks completed?

Success: The progress was assessed in line with the Gantt chart.

7.9. Performance monitoring.

What to check: Are the printer issues decreasing and the paper usage reduced?

Success: Printer issues are not persisting, and paper usage is acceptable.

7.10. Final evaluation

What to check: Were the project objectives achieved?

Success: The targets were met and the implementation of procedures was smooth.

Ongoing adherence to protocol will be assessed via a daily record of printer health and maintenance checked, then with additional scope for intermittent maintenance and reporting of concerns. These will be accessible at the point of use with note of a designated point of contact (perhaps within the IT department) for concerns, which can either be solved by the employees with the troubleshooting guide, by the skilled IT employees or escalated to an external

repair technician as necessary – with additional temporary action plans put in place by senior management to avoid or minimise disruptions in the interim period. Relevant stakeholders contacted as necessary for smooth ongoing business operation.

These steps should reliably circumvent significant printer issues and give a practical and effective approach to dealing with them when they do arise.

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