Proof of Concept

Portable Document Repo

SIMPLE <u>FICTIONAL</u> EXAMPLE FOR VUW COURSE ENGR401 ONLY. <u>NOT REAL DATACOM ENGAGEMENT IN ANY WAY</u>

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1   PROOF OF CONCEPT OVERVIEW

1.1   Recommendation

As part of the active "Document Management System" review project, the scope should be expanded to include the use of iPad/Android type devices by staff for accessing copies of key artefacts in the field. Its expected this would add approximately 1 month of design and build effort to that existing project.

The H&S benefits of not having staff move 6-8kg boxes of documents in and out of vehicles and needing to lose an hour of productive time every morning printing necessary documents would outweigh the costs of purchasing and supporting tablet devices. The need to agree standard document formats within "Dagger Diggers", the need to formally select the right type of mobile device, and the need to address identified issues with synchronisation of files means this is right to include in-scope of a project versus simple make the PoC into "Production". There should be consideration to letting the Wellington Field Engineers continue to use the PoC solution in the meantime given the positive feedback from them and reported benefits.

1.2   Background

At present "Dagger Diggers Ltd" have field engineering teams that attend jobsites to consult on how large scale excavation should work, review progress, address seismic instability problems and make plan changes, and consult with landholders. In order to do this effectively, the back of their 4x4 vehicles often carry 4-6 large crates of printed documents covering every historic artefact they may need during the day (10 years of geological survey for the site, all commercial contracts with the landholder, approved engineering drawings and amendments, maps of the property, job/engagement details and target state diagrams, etc).

These are extremely heavy to physically move, and each morning the field engineers need to spend at least 30 minutes verifying they have the latest copies of each document as well as that they have the documents needed during the day.

Historically this has always been done in hard copy c/- laptop battery life not being sufficient for more than a few hours work, and the teams often working in locations with zero bandwidth.

"Dagger Diggers" have asked to explore the value in the team having a "Digital Document Repository" that they can easily take with them into the field, synchronised by the engineer triggering a job to get the latest material from central document repo when time and network coverage permits, and has the battery life to last all day (or be easily charged back up from the 4x4 vehicles).

1.3   Key Proof of Concept Stakeholders

- End Users - "Dagger Diggers Ltd" Wellington Field Service Engineering Team (limited to one team for PoC)
- Initiative Owner & Decision Maker - "Dagger Diggers Ltd" Field Engineering Service Manager
- Initiative Decision Maker - "Dagger Diggers Ltd" IT Manager
- Initiative Tech Design, Delivery, and Support – "Clever People IT Services Tech Architect"

1.4   Measures of Success

- Field Service Engineers can tag directories on central document repo that are needed on the "Portable Document Repository", and have all latest copies of documents in those directories synchronised.
- Field Service Engineers can view any document they would have currently carried in hard-copy within the rear of the 4x4 vehicles while onsite with work-crews and customers (potentially in a zero-bandwidth environment)

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- "Portable Document Repository" devices can keep working for at least a 12 hour work shift including charging off 4x4 vehicle power-supply.

- Optionally Field Service Engineers make updates to any document within the "Portable Document Repository" and when connectivity next allows it, they can select to synchronise those changes back to the central repository.

1.5   Scope

In Scope	Out of Scope
Wellington Field Service Engineering Team	Any other of the NZ or AU based Field Service Engineering Team
PoC to run for two months and then be decommissioned prior to capital works project for final solution build.	PoC solution being used beyond the two month mark, and accepted into normal production use without agreement of "Dagger Diggers" IT Manager & Field Services Engineering Manager.
PoC IT solution supported by "Clever People IT Services" during business hours under best-efforts arrangement (expected response to be within 12 hours of fault report).	Support of any IT other than that involved with the PoC, and support outside of business hours.
Ability to open MS Word Documents, PDF Documents, PowerPoint Documents, Apple Pages documents, AutoCAD diagrams, PNG Diagrams, and Visio Drawings on the "Portal Document Repository Device"	Ability to open any other type of document/file on the PoC device, or use the device for any other function (e.g. – email).
Ideally the ability to update MS Word Documents, Apple Pages Documents, and Power Point Documents. Ability to 'markup' PDF documents (e.g. – sign them or annotate drawings with a stylus)	Ability to update any other type of document/file on the PoC device.

1.6   Approach Taken

The 5 Wellington Field Services Engineering Team members will be given iPads specifically assigned to them for a three month period marking the duration of the PoC. These iPads will be locked down to require finger-print verification from the involved Field Service Engineers, as well as having the ability to install other applications from the Apple App Store disabled. These restrictions will be carried out through simple 1-off configuration for each of the 5 iPads needed for the 5 Engineers.

The existing "Dagger Diggers" Microsoft 365 SharePoint Document Repository (Cloud Based Repo) will be made available to each of the iPads under the Engineers individual user accounts for security purposes. The "Store Offline" feature will be enabled.

The 5 Wellington Field Service Engineers will be trained on how to open and synchronise documents during the initial month of the PoC, and use of the devices alongside physical hard-copy filled packing crates will continue while confidence is gained in the devices. For two months the Engineering team will then attempt to use the iPads as their primary method of retrieving and viewing/managing documents while in the field.

Issues will be reported using email to the provided IT Support dedicated to this PoC. While "Dagger Diggers" Service Desk will be made aware of the PoC and provided with an iPad for experience, they will not be expected to provide BAU support.

At the end of each month the Engineers will be surveyed for feedback, and a formal review carried out at the end of the second month. At this point the iPads will be returned, the associated SharePoint access re-disabled, and a decision made regarding the value of wider adoption through a capital project with full IT support and normal asset management.

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2 OUTCOME

2.1 Measure of success

The following scoring system has been used to quantify the success of the proof-of-concept in meeting each of its stated objectives.

Score	Definition
5	Complete success, deliverable demonstrated in full.
4	Mostly successful, deliverable demonstrated but improvements could be made for the final solution. Outstanding issues captured in Section 8.
3	Partial success, deliverable partially demonstrated, further investigation required. Outstanding issues captured in Section 8.
2	Incomplete. Deliverable unproven due to lack of time or resources.
1	Failure. Deliverable not possible using the technology or processes used in the Proof of Concept.

Criteria	Score
Field Service Engineers can tag directories on central document repo that are needed on the "Portable Document Repository", and have all latest copies of documents in those directories synchronised.	4
Field Service Engineers can view any document they would have currently carried in hard-copy within the rear of the 4x4 vehicles while onsite with work-crews and customers (potentially in a zero-bandwidth environment)	4
"Portable Document Repository" devices can keep working for at least a 12 hour work shift including charging off 4x4 vehicle power-supply.	5
Optionally Field Service Engineers make updates to any document within the "Portable Document Repository" and when connectivity next allows it, they can select to synchronise those changes back to the central repository.	3

2.2 Deliverables not fully recognised

At times the synchronisation of documents did not work correctly. Potentially due to other authors editing the documents offline, the Engineers reported "unhelpful technobabble" errors appearing when they attempted to download fresh copies of documents in the morning. A work around was found by the Engineers simply purging the local copies of all documents and downloading from empty.

There were issues with the visibility of the iPad screens in direct sunlight. This affected the ability of the Engineers to read any document which would have not been a problem with hard-copy.

The efforts to allow for markup and edits of the documents was not reliable. There were versions of PDF documents that did not allow for any markup to be applied and in the timeframe available for the PoC this was not resolved.

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2.3   Defects

Engineers were not able to use the capacitive touch screens of the iPads while wearing PPE insulated gloves. For expediency stylus devices were purchased and supplied that allowed for the screen to be manipulated without removing their gloves.

The inability to reliably edit PDFs appeared to relate to default permissions set on the PDF printing application used by "Dagger Diggers". Once set to allow markup the problem seemed to disappear, but will require further investigation.

The impact of grease and direct sunlight on the screens was a continual problem. It was partially offset by applying anti-glare screen protectors, but not entirely.

2.4   Items for future consideration

Deployment of any reader device into the field needs to be teamed up with ensuring document/artefact creation processes within the organisation are modified to create compatible formats.

Engineers would often need to share their tablets (ease of physical access while onsite versus returning to their truck to get their assigned devices). As a result, electronic audit trails of who was accessing what document was not retained, however this is considered similar to what occurs today with uncontrolled paper copies. Potentially worth "Dagger Diggers" reviewing the importance of such electronic audit trails and/or taking care if permitting future digital signoff of engineering specification updates that need to meet regulatory requirements.

Synchronisation of documents for use offline needs further investigation and testing. Investigation of user-friendly error messages or better training and processes for document management agreed.

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APPENDIX A – ADDITIONAL INFORMATION

- None

EXAMPLE - Portable Document Repo - Structured Proof of Concept.docx

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