

## TECHNICAL REVIEW OF DIGIFONICA VOIP SYSTEM



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**Company Confidential**



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# 1 Introduction

## 1.1 Background

Smart421 have been engaged to perform a high level technical review and appraisal of the Digifonica VoIP (Voice over Internet Protocol) application software and development processes. The review team from Smart421 consists of two experienced technical staff, assigned over a period of three weeks.

Digifonica are an international telecommunications company, having their development offices based in Vancouver, Canada. They have developed a VoIP solution that utilises hosted systems and leased network links across the globe, such that VoIP calls made over this network can be reliably routed and controlled within this environment.

VoIP provision is provided by Digifonica as a wholesale service through a range of reseller arrangements. Resellers or partner companies are given a 'white box' or unlabelled service that they can customise to suit their own markets and customer base, including pricing and packaging terms.

Digifonica do not plan to offer the VoIP service to end customers directly, only providing the service through partner companies, who also have the responsibility of providing first-line support to their customers. Initial services are offered to 'Tier 3' level partners, with Digifonica managing the network hardware and customer management back-end systems. Higher level partners will be provided with integration facilities to work with Tier 1 and Tier 2 customer and billing database systems.

## 1.2 Review Stages

The technical review has being performed in three consecutive stages, as follows:

### Stage 1 – Initial System Appraisal, Document Review (UK)

- Receive high-level documentation to gain familiarity with the system.
- Perform early analysis and review of provided documentation.
- Identify areas for more detailed technical review.
- Produce Stage 1 Report indicating progress so far

### Stage 2 – Technical Review of Code and Processes (Canada)

- Travel to Vancouver to visit Digifonica offices and staff.
- Investigate development processes and use of standards.
- Meet with team members for question-and-answer sessions.
- Perform code review on selected components.

### Stage 3 – Report Completion and Presentation (Canada/UK)

- Update report with latest findings.
- Perform internal review of document against Smart421 standards.
- Present final review document to Digifonica.

## 2 Management Summary

This section of the document provides the highlights of the full report, for use where the reader does not require the detailed information as described in subsequent sections of the report.

### 2.1 Summary Introduction

The review process was performed by Smart421 with the full co-operation of staff at Digifonica.

One of the impressions gained from the review was of the willingness of those staff to assist in providing all required information, with no apparent hiding of technical or operational issues.

Stage 1 of the review process provided a good understanding of the overall system, covering the requirements and functionality of the Digifonica VoIP solution. Stage 2 involved meeting key personnel within Digifonica to discuss and further understand the processes and system design used by the company.

The second stage of the review helped to identify the distinction between the current 'Version 1' implemented system environment, the 'Version 2' development under way at present, and other features that could be incorporated in any future releases.

The distinction between the different development versions or phases has been applied to generate different sets of results from this review, to allow the report to indicate the immediate position and the position that the company is directly moving towards. This highlights the actions already being taken by Digifonica to address potential issues in the current platform, which is a positive step and not to be taken as any particular failure in company operations.

### 2.2 Calculated Results

Tables in the detailed section include numeric figures that show a simple percentage representation so that ranking of areas of the system can be compared for 'completeness' and 'surety'.

For a full explanation and breakdown of these figures, repeated below, refer to later sections of this document that describe their generation and interpretation.

	Version 1 (Current)	Version 2 (Planned)
Average Percentage 'Complete'	56%	85%
Average Percentage 'Surety'	63%	88%

Also note that it is generally unrealistic to expect any organisation to generate a 100% ranking in results of this sort, whether that is a new company or an older, well-established company. A reasonable target for most companies

A pragmatic approach to live service delivery is much more important than having an organisation that restricts operations with large administrative overheads, which may be the only way to achieve maximum review results.

### 2.3 Key Conclusions

In summary, the main points drawn from this review are bulleted below:

- Documentation – clear and concise at a high level, would benefit from more technical content, as expected to arise during the Version 2 development process
- Design and Code – designed for scalability, reliability and flexibility; well structured code following good practices with peer review to verify correctness of developed programs
- Development Process – historical process was lighter but well controlled; new process in place for subsequent development now more formal, as expected of a company now responsible for live service provision and maintenance
- Test and QA – testing now also more formal and with greater coverage than earlier releases
- General – company culture is correct with strong emphasis on reliable service delivery; recruitment has attracted experienced technical staff for the main development team; team management appears to be well structured and controlled; further processes will be needed to maintain the exchange and recording of information as the company grows further still.

## 2.4 Summary Comments

Particular points and comments drawn from the technical review are listed below.

### 2.4.1 Company Approach

Digifonica has seen some recent expansion in staff over the past few weeks and months, increasing both technical capacity and sales and management for operational activities. During this time, the technical side of the company has implemented more formal methods to the design, code and test process. This addresses the potential issues identified from the historical development phase.

Project management activities have been well controlled in both phases of the company, and the newer development process ties in well with the approach used in tracking new features and releases.

The company has a clear commitment to the creation and delivery of a reliable and robust service, with a strong view to using existing standards and technologies in association with their own custom developments to create the Digifonica VoIP system that has the necessary technical controls needed to incorporate the desired functionality of the managed service.

### 2.4.2 Software Development

During the review, it was apparent that development of the core technology had been performed over a longer period of time by a small number of key technical staff. During this stage, formal process had been kept to a minimum. This was balanced by the commitment to quality shown by these staff, and information exchange between individuals ensured that developed was well controlled.

It seems that the web-based application area had been written more recently, in a shorter space of time. This is seen as something of an 'add-on' to the call-handling core components of the system, although equally important in the provision of the overall VoIP service. Some deficiencies were spotted in the initial web-app implementation, although these were not viewed as overly important and not critical at this stage.

At the coding level, there is a clear split between the core functional components and that of the web applications in support of the complete system. The core code appears to be very well written and has been tested in live operation and destructive testing by developers over a period of time. This gives a high level of confidence in the call-handling capabilities of the system.

The current web application does not appear to be so far along the development path, although it seems to be fully functional and usable for Tier 3 customers as intended. The deficiencies in this area of application code are expected to be resolved in the Version 2 software release, where stricter design and development processes are in place.

### 2.4.3 System Documentation

At the design level, some additional documentation would be useful to describe the breakdown of core components and their interactions and interfaces. At present, this information is understood by current team members, but requires an informal process to bring on additional technical staff. If fully documented, this could shorten the training time needed for familiarisation of system operation as new staff become involved in development or support. It would also assist any external companies that may be involved in integration or custom development tasks.

The absence of this level of documentation is not a major problem and does not point to poor design practices, it is just noted as an area of some deficiency. It is also noted that the newer development process will generate further documentation for new features and new releases. This approach is likely to remedy the documentation shortage over time, reducing or removing this as an issue.

### 2.4.4 Performance Testing

Performance metrics for the system have not yet been proven, due to the unavailability of a suitable test environment to drive the system at high loads or throughput levels. Test plans are in place to generate the benchmarks and volumetrics figures for various combinations of Digifonica software and hardware components. It is viewed that these tests, when performed, will provide accurate and usable figures for use in determining the throughput and scalability of the system.

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