Project Name:	Allegro - Multi-point Integration Platform for Mobile Applications	**Start Date:**	2022-04-12
Project Number:	2203	**Completion Date:**	2022-12-30

Project Details:

Scientific or Technological Objectives:

Measurement	Current Performance	Objective	Has results?
distributed transaction timeout (1= yes/ 0 = no)	0	1	Yes
intelligent packet routing (yes = 1 / no = 0)	0	1	Yes

The following example is based on the Tax Court of Canada judgement ALLEGRO WIRELESS CANADA INC., and HER MAJESTY THE QUEEN, March 31, 2021.

58] Only the portion of 2011 Project 1 identified by the CRA as TA1/TO1 is before the Court. The CRA accepted that the portion it identified as TA2/TO2 qualified as SR&ED. The Appellant conceded during the hearing that the portion of 2011 Project 1 identified as TA3/TO3 did not constitute SR&ED.

TA1/TO1 of 2011 Project 1

183] The Appellant described the technological advancements it was trying to achieve for all of Project 3 as follows:

184] The technological objective of this project was to develop an integration platform for mobile devices that enables dynamic multiple endpoints.

Specifically, the objective was to develop methods to enable mobile data packets to be intelligently routed to different applications without the need for setting up specific end points or messaging agents for each integration point.

185] With respect to TA1/TO1 of Project 3, the Appellant hoped to achieve a technological advancement by developing a connection timeout mechanism for distributed transactions initiated by a mobile device.

Field of Science/Technology:

Communication engineering and systems (2.02.06)

Project Details:

Intended Results:	Improve existing processes
Work locations:	Research Facility
Key Employees:	Wesley Rupel (Allegro PI) (Physics - PhD (1985) / President & CTO), Gerald Penn (Allegro Expert Witness) (Computer Science - PhD (1991) / Expert witness)
Evidence types:	Test protocols, test data, analysis of test results, conclusions; Records of resources allocated to the project, time sheets; Design, system architecture and source code; Records of trial runs

Scientific or Technological Advancement:

Uncertainty #1: necessary wait times

185] The technological obstacle the Appellant faced was related to mobile transaction timeouts. The Appellant noted that the main purpose of its system was to provide data to client devices such as mobile devices. This required data to be sent across high-latency cellular networks. Because of the latency of cellular networks, it is not easy to determine whether a connection has timed out.

186] Mr. Rupel noted that people confuse bandwidth with latency. Latency is another aspect of speed or timing. He noted that information may pass through a system at a high speed (high bandwidth) and still be delayed in arriving at its destination (high latency).

187] He explained that cellular networks are high latency when compared with wire networks.

In a cellular network,

"there's a lot more handshaking that has to go on with decoding what's in the radio waves and the layers of technology that has to filter through in order to just get where you're going with it that initial delay is worse on a wireless network, especially on a cellular network."

188] The timeout was the same as in 2010 Project 2, but the timeout in 2011 Project 1 caused a different problem.

Mr. Rupel explained that the Appellant's system bundled up business logic messages and sent it through the system. As discussed previously, the messages are broken up into pieces and sent through in little packets, which are reconstructed on the other side.

The process has what is referred to as a queuing mechanism. The Appellant's software handles what is in the queue to feed the information through the underlying black box and then reconstruct it on the other side. The timeouts were causing problems in the fidelity of the Appellant's queuing process.

189] For example, the timeout may cause the system to reset. Once it resets it feeds all the information sitting in the queue into the system at such a fast rate that it overwhelms the device.

The most significant underlying key variables are:

filtering methods vs. latency vs. ..., timeout length vs. queuing mechanisms

Technology or Knowledge Base Level:

Benchmarking methods & sources for citings:

Benchmark Method/Source	Measurement	Explanatory notes
Internet searches	10 Articles	Client could not find any libraries of necessary wait times for the proposed application.

Activity #1-1: Activity 1 (Fiscal Year 2022)

Methods of experimentation:

Method	Experimentation Performed
Trials:	1400 runs / samples

190] As a result, the Appellant had to conduct tests on application timeouts to determine the optimal timing.

Mr. Rupel noted that there are a lot of trade-offs in the timing in that if you make it too short, you have one set of problems, if you make it too long, you have another set of problems.

It was trying to find the "sweet spot", complicated by the fact that it was working with black boxes and had no way to know if the individual problems that occurred on one extreme or the other were going to become unacceptable from a business standpoint.

Results:

- distributed transaction timeout: 1 1= yes/ 0 = no (100% of goal)
- intelligent packet routing: 1 yes = 1 / no = 0 (100% of goal)

Conclusion:

191] He (Dr. Penn) provided the following opinion in his written report:

. . . the development of a mechanism that waits a specified period of time before resetting a network connection is standard practice, and the experimentation required to set the wait time often involves only a trivial amount of experimentation. . . . however,

knowing how long to wait when developing a product within an ecology of foreign devices and on multiple cellular networks is not routine.

Allegro were building just such a knowledge base

[knowledge of necessary wait times]

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that would have been of value to members of the broader community of mobile software developers, including those who had never intended to purchase Allegro's products. This was the result of applied research.

Significant variables addressed: filtering methods vs. latency vs. ..., timeout length vs. queuing mechanisms

Documentation:

- Offline Documents: docs

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