Docket: 2017-3837(IT)G

BETWEEN:

NATIONAL R & D INC.,

Appellant,

and

HER MAJESTY THE QUEEN,

Respondent.

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Appeal heard on October 2 to 4, 2019, at Toronto, Ontario

Before: The Honourable Justice Dominique Lafleur

Appearances:

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| Counsel for the Appellant: | Jonathan N. Garbutt |
| Counsel for the Respondent: | Angelica Buggie |

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**JUDGMENT**

The appeal from the assessment made under the *Income Tax Act*, for the 2011 taxation year, the notice of which is dated November 3, 2014, is dismissed, with costs to the Respondent, in accordance with the attached Reasons for Judgment.

Signed at Montréal, Québec, this 7th day of July 2020.

"Dominique Lafleur"

Lafleur J.

Citation:2020 TCC 47
Date: 20200707
Docket: 2017-3837(IT)G

BETWEEN:

NATIONAL R & D INC.,

Appellant,

and

HER MAJESTY THE QUEEN,

Respondent.

## REASONS FOR JUDGMENT

## A. INTRODUCTION

[1] National Research & Development Inc. ("National"), a Canadian-controlled private corporation, which was incorporated on January 1, 2011, provided consulting services to clients in the areas of engineering, information technology, scientific research and experimental development tax credits and Ontario interactive digital media tax credits. It filed an appeal with this Court in respect of an assessment, the notice of which is dated November 3, 2014, made under the *Income Tax Act*, R.S.C., 1985, c. 1 (5th Supp.) (the "Act"), for its 2011 taxation year, which ended on July 31, 2011 (the "2011 taxation year").

[2] In so assessing, the Minister of National Revenue (the "Minister") was of the view that the activities undertaken by National with respect to the development of a project called Project Tracking System (the "PTS Project") did not meet the criteria of the definition of scientific research and experimental development ("SR&ED") in subsection 248(1) of the Act. Consequently, the Minister disallowed the claim made by National for the expenses it incurred with respect to the PTS Project, totalling $68,029, which were claimed as SR&ED expenditures under the Act. The Minister denied the deduction of the said expenses as well as the investment tax credit ("ITC") of $23,810 claimed in connection with these expenses.

[3] During the 2011 taxation year, the sole shareholder and president of National was Mr. Amit Saini. Mr. Saini was the only witness at the hearing. He

was directly involved in the PTS Project as he conducted the activities himself, with the help of a student. Mr. Saini was accepted by the Court as a "litigant expert" (*Kaul v. The Queen*, 2017 TCC 55, at para. 32).

[4] Mr. Saini obtained a Bachelor of Engineering degree from McMaster University in 2003 and got his professional engineering license in 2007. He also obtained a Master of Business Administration degree (MBA) from Wilfrid Laurier University in 2010, a Certified Management Accounting (CMA) designation in 2011 and a Chartered Professional Accounting (CPA) designation in 2012. Before founding National, he was employed by Meyers Norris Penny from April 2010 to March 2011 as a SR&ED manager. From July 2006 to April 2010, he was employed by ATS Automation Tooling Systems as a senior SR&ED specialist. Prior to that, he had worked as a manufacturing engineer and product manager at Precision Resource Inc. and in these capacities he was responsible for identifying and tracking SR&ED projects, and he had developed a web-based inventory system using ASP and SQL Server 2000.

[5] I did not qualify Mr. Dowd, the expert hired by National for the purposes of this appeal, as an expert witness at the hearing. The Respondent did not call any witnesses.

[6] In these reasons, all references to statutory provisions are to provisions of the Act, unless otherwise indicated.

## B. ISSUE

[7] The sole issue is whether the activities undertaken by National in developing the PTS Project during the 2011 taxation year constitute SR&ED within the meaning of subsection 248(1).

[8] At the hearing, the parties filed a final joint statement of facts (Exhibit AR-2) in which they stated that, if the Court was to conclude that the activities undertaken by National in developing the PTS Project qualified as SR&ED within the meaning of the Act, the parties agreed that the amount of current SR&ED expenditures incurred by National was $42,284.54.

## C. POSITIONS OF THE PARTIES

[9] National submits that its activities constituted SR&ED within the meaning of subsection 248(1) because those activities constituted experimental development. Specifically, National submits that the PTS project was undertaken for the purpose of technological advancement. National argues that sufficient due diligence was done and sufficient evidence was provided regarding the state of the art in 2011 to show that there was technical uncertainty with regard to achieving National's objectives. While developing the PTS Project, National formed hypotheses for the reduction or elimination of the technological uncertainties, followed the scientific method and detailed records of the hypotheses and tests conducted were kept.

[10] The Respondent submits that the activities of National did not constitute SR&ED within the meaning of subsection 248(1). More specifically, the Respondent is of the view that National has not met its burden in showing on a balance of probabilities that the activities of National in respect of the PTS Project involved technological uncertainty and technological advancement, nor can National show that a systematic investigation was carried out in accordance with the scientific method. According to the Respondent, very little research into the state of the art was undertaken by National either before or during the course of the project, and routine engineering could have been used to solve the problems encountered. Furthermore, the Respondent also argues that the documents provided by National were not made contemporaneously with the development of the PTS Project. Finally, the Respondent submits that Mr. Saini was not credible as a witness because of inconsistencies in his testimony and that very little weight should be given to his evidence.

## D. LAW AND CASE LAW

[11] SR&ED is defined in subsection 248(1) as follows:

> **scientific research and experimental development** means systematic investigation or search that is carried out in a field of science or technology by means of experiment or analysis and that is
>
> **(a)** basic research, namely, work undertaken for the advancement of scientific knowledge without a specific practical application in view,
>
> **(b)** applied research, namely, work undertaken for the advancement of scientific knowledge with a specific practical application in view, or

> **(c)** experimental development, namely, work undertaken for the purpose of achieving technological advancement for the purpose of creating new, or improving existing, materials, devices, products or processes, including incremental improvements thereto,
>
> and, in applying this definition in respect of a taxpayer, includes
>
> **(d)** work undertaken by or on behalf of the taxpayer with respect to engineering, design, operations research, mathematical analysis, computer programming, data collection, testing or psychological research, where the work is commensurate with the needs, and directly in support, of work described in paragraph (a), (b), or (c) that is undertaken in Canada by or on behalf of the taxpayer,
>
> but does not include work with respect to
>
> **(e)** market research or sales promotion,
>
> **(f)** quality control or routine testing of materials, devices, products or processes,
>
> **(g)** research in the social sciences or the humanities,
>
> **(h)** prospecting, exploring or drilling for, or producing, minerals, petroleum or natural gas,
>
> **(i)** the commercial production of a new or improved material, device or product or the commercial use of a new or improved process,
>
> **(j)** style changes, or
>
> **(k)** routine data collection.

[12] In paragraph (c) of that definition, "experimental development" is defined as " . . . work undertaken for the purpose of achieving technological advancement for the purpose of creating new, or improving existing, materials, devices, products or processes, including incremental improvements thereto".

[13] Hence, one must ask the following questions *(Les Abeilles Service de Conditionnement Inc. v. The Queen*, 2014 TCC 313, at para. 140 [*Les Abeilles*]):

i) Were the activities in the PTS Project undertaken by National for the purpose of achieving technological advancement?

ii) Were the activities undertaken for the purpose of creating new products or processes, including incremental improvements thereto?

[14] Furthermore, given the first part of the definition of SR&ED, it must be shown that a systematic investigation or search was carried out by means of experiment or analysis.

[15] The case law has established five criteria for determining whether a particular activity qualifies as SR&ED. These criteria were laid down by Justice Bowman, as he then was, in *Northwest Hydraulic Consultants Ltd. v. R.* ([1998] 3 C.T.C. 2520 (TCC), at para. 16 [*Northwest Hydraulic*]). In establishing these criteria, Justice Bowman reviewed Information Circular 86-4R3 dated May 24, 1994 (the "Circular"), and stated that it was a generally useful and reliable guide (*Northwest Hydraulic*, at para. 15).

[16] As regards the application of these criteria, Justice Bowman also commented that "[t]he tax incentives for doing SRED are intended to encourage scientific research in Canada . . . as such the legislation dealing with such incentives must be given such fair, large and liberal construction and interpretation as best ensures the attainment of its objects" (*Northwest Hydraulic*, at para. 11).

[17] These same criteria were later approved by the Federal Court of Appeal in two subsequent cases, *RIS-Christie Ltd. v. R.* ([1999] 1 C.T.C. 132 (FCA), at para. 10 [*RIS-Christie*]) and in *C.W. Agencies Inc. v. The Queen* (2001 FCA 393, at para. 17 [*C.W. Agencies*]).

[18] The Federal Court of Appeal summarized these criteria in *C.W. Agencies* at para. 17 as follows:

> 1. Was there a technological risk or uncertainty which could not be removed by routine engineering or standard procedures?
>
> 2. Did the person claiming to be doing SRED formulate hypotheses specifically aimed at reducing or eliminating that technological uncertainty?
>
> 3. Did the procedure adopted accord with the total discipline of the scientific method including the formulation[,] testing and modification of hypotheses?
>
> 4. Did the process result in a technological advancement?
>
> 5. Was a detailed record of the hypotheses tested, and results kept as the work progressed?

## E. THE PTS PROJECT

[19] The PTS Project is a computer program National was developing that would automate certain portions of filing SR&ED claims with the Canada Revenue Agency ("CRA"). The objective of the PTS Project was to develop a web-based, cross-platform and cross-browser framework to track claimable SR&ED projects for National's clients. Mr. Saini wanted the PTS Project to allow users to be able to input SR&ED data through a web browser, then have all data from all users stored in a central repository, to efficiently sort through all this data to produce only specific entries belonging to specific clients, and then to have the client be able to access the relevant data through their web browser.

[20] Additionally, Mr. Saini wanted the PTS Project to be very secure. In order to meet National's security requirements, the PTS Project involved a configuration that Mr. Saini referred to as multi-tiered architecture. The specific multi-tiered architecture configuration chosen by Mr. Saini utilised ADO, Classic ASP, COM+ and Microsoft SQL Server 2000 (the "MTA"). Mr. Saini testified that he had knowledge of the various components of the MTA and had worked with them over the years.

[21] Mr. Saini testified that in developing the PTS Project there were two key restrictions that were imposed on the project. The first was a restriction on the cost of the project specifically the tools that were to be utilized were limited to those already owned by National. The second restriction involved the expertise of employees of National, and limited the technologies utilized to only those with which its employees had experience.

[22] The first phase of the PTS Project, which was carried out during the 2011 taxation year, involved establishing an efficient and concise time-tracking system, and it had three sub-objectives (hereinafter collectively referred to as the "Objectives"):

1. To develop techniques for record set paging, sorting, and indexing that were compatible with the MTA ("Objective 1");

2. To develop a mechanism for in-memory array initialization of joint record sets such as "pivot-like output" ("Objective 2"); and

3. To develop methods for deterministic and stateful client-side control ("Objective 3").

[23] Work was performed under Objective 1 to develop techniques for record set paging, sorting and indexing that were compatible with ADO, Classic ASP, Com+

and Microsoft SQL Server 2000. According to Mr. Saini, it was necessary to efficiently sort through the data, to push it from SQL Server 2000 through the MTA to the browser incrementally and then to display very quickly only data relevant to a particular client. Work undertaken to achieve this objective involved trying to overcome the paging limitations of SQL Server 2000 using "DataGrid" and "GridView" in ASP. Mr. Saini also testified that he tried using the ASP response buffer to incrementally push the data to the browser, but that method did not work. Other techniques that Mr. Saini attempted which were not successful include using "GetRows" in ADO and using temporary tables to achieve pagination. Eventually, the work undertaken resulted in the creation of what Mr. Saini referred to as the "Stitching Mechanism", a piece of code which allowed SQL statements to be constructed dynamically and allowed simple queries which utilized single-column sorting to return results. That technique was further refined and eventually some success on this point was achieved. According to Mr. Saini, the Stitching Mechanism which utilized dynamic SQL was an invention developed by National, but National was only partially successful in attaining the results desired under Objective 1.

[24] Work was performed under Objective 2 to develop a mechanism, such as a "pivot-like output" for in-memory array initialization of joint record sets. The goal was to emulate pivot tables, which is a reporting mechanism in Microsoft Excel that aggregates and summarizes data, but to do so in a web-based program. Mr. Saini testified that he knew that SQL Server 2005 had a PIVOT command, but that it was not advanced enough to meet the objectives of National. However, National still tried to emulate the functionality of the PIVOT command in SQL Server 2000. National encountered numerous problems and was unable to effectively emulate the PIVOT command in SQL Server 2000. After attempting other methods that were also unsuccessful and in a final attempt to achieve Objective 2, National tried to integrate SQL Server 2000 reporting services, but this method encountered compatibility issues with portions of the MTA and did not work. Ultimately, this objective was unsuccessful and was never achieved.

[25] Work was performed under Objective 3 to develop methods for deterministic and stateful client-side control. National was trying to develop the ability to pass information from SQL Server 2000 through to the MTA and then to the browser in a manner that would make users believe that all of the previews for their choices were being generated instantaneously, when in fact the data was not pushed from SQL Server 2000 through the MTA to the browser until the actual choice was made. In order to complete this objective, National tried a few different things. Mr. Saini testified that they first attempted to use section variables and

cookies to store the information and make the process appear instantaneous, but that method did not work. The second method that was attempted was to temporarily store the data at the browser level and to hide that data from the user. Since the browser was unable to store the required amount of data, this method was unsuccessful. Finally, National developed the "handout" method, which involved a hybrid between ASP and JavaScript that performed recursive posts to the server. The "handout" method resulted in some success.

[26] The PTS Project never successfully achieved all of the Objectives, although, according to Mr. Saini, there was some degree of success on all three.

## F. ANALYSIS

[27] The onus is on National to show, on a balance of probabilities, that the activities undertaken by National in developing the PTS Project during the 2011 taxation year constitute SR&ED.

[28] Before reviewing each of the relevant criteria to determine whether a particular activity qualifies as SR&ED, I want to point out that these criteria must be applied within the context of National's business environment (para. 2.11 of the Circular).

[29] Mr. Saini's testimony was clear in that the PTS Project was to be developed through the MTA. The MTA consisted of ADO, Classic ASP, COM+ and SQL Server 2000. Mr. Saini had determined that SQL Server 2000 would be used for that purpose and not SQL Server 2005. Furthermore, the framework of the PTS Project had to be web-based, cross-platform and cross-browser compatible. The fact that SQL Server 2005 existed and had a PIVOT command at the time is not relevant for the purpose of determining whether the activities undertaken by National qualify as SR&ED.

[30] However, even considering the context of National's business environment, for the following reasons, I find that the activities undertaken by National in developing the PTS Project do not constitute SR&ED.

> *(1) Was there a technological risk or uncertainty which could not be removed by routine engineering or standard procedures?*

[31] On the first criterion, the technological uncertainty criterion, Justice Bowman stated in *Northwest Hydraulic* (at para. 16), that the technological

risk or uncertainty must be such that it "cannot be removed by routine engineering or standard procedures" and that if "the resolution of the problem is reasonably predictable using standard procedure or routine engineering there is no technological uncertainty". The term “standard procedure” refers to "techniques, procedures and data that are generally accessible to competent professionals in the field.”

[32] In order for the PTS Project to meet this criterion, the overall activity undertaken by National must contain technological uncertainties. It must further be determined that the solution for these uncertainties could not be achieved through the use of available technological knowledge and experience. This criterion will be met if the uncertainties cannot be removed by routine engineering or standard procedures, and whether the activity is successful or not. As indicated at paragraph 2.11 of the Circular, “the activities undertaken to resolve technical uncertainties are eligible if the taxpayer cannot obtain the solutions through commonly available sources of knowledge and experience in the business context of the firm.”

[33] Mr. Saini testified as to the technological uncertainties in the PTS Project. In 2011, there was no web-based program that would allow for time tracking of SR&ED projects. A program called QuickBooks Online can be used nowadays, but Mr. Saini testified that back in 2011 that program was in its infancy and its functionality was limited. Another program that Mr. Saini testified he had reviewed was called Kashoo. According to Mr. Saini, neither program had an effective time-tracking component at the time. Yet, another program reviewed by Mr. Saini was R&D Manager. However, Mr. Saini testified that this program was too rudimentary to meet National’s needs.

[34] As a preliminary step or as the work was progressing, Mr. Saini examined various technical articles, copies of which were adduced in evidence, to determine whether it was possible to achieve the objectives of the PTS Project within the MTA.

[35] In respect of Objective 1, Mr. Saini testified that he conducted internet research and as a result consulted three articles, namely: “Efficiently Paging Through Large Result Sets In SQL Server 2000” (Exhibit A-4, at p. 41), “SQL Server 2000 Paging and Sorting Using ROWCOUNT And SQL_VARIANT” (Exhibit A-4, at p. 46), and “Efficient Paging of Recordsets: SQL Server 2000” (Exhibit A-4, at p. 53).

[36] Mr. Saini testified that solutions described in these articles would not work within the MTA for various reasons. Some of the methods described did not return results reliably or efficiently. Additionally, one of the methods described only worked in static environments (the environment for the PTS Project needed to be dynamic). After reviewing the above-mentioned articles, Mr. Saini concluded that there was no existing method that he could use within the MTA that met all of National's criteria.

[37] In respect of Objective 2, Mr. Saini testified that he also conducted internet research, and he referenced one article entitled: "Pivot and Un-Pivot data in SQL" (Exhibit A-4, at p. 82). According to Mr. Saini, the method described in this article only works in a static environment, and was not suitable for National's needs. Mr. Saini testified that at that time pivot tables were not available in an application that was accessible through a web browser and that pivot tables had definitely not been used in combination with anything similar to the MTA. Mr. Saini also researched the PIVOT command available in SQL Server 2005 and concluded that it would not solve the problems encountered by National. Mr. Saini testified that the PIVOT command was only available in SQL Server 2005, and not in SQL Server 2000, which is a different version of the program than the one National was using. Further, the PIVOT command only worked in SQL Server 2005, and was not necessarily compatible with the other components of the MTA. Finally, National had already purchased SQL Server 2000 and did not have the means to purchase SQL Server 2005. Furthermore, Mr. Saini did not think that the PIVOT command in SQL Server 2005 would even achieve National's objectives.

[38] In respect of Objective 3, Mr. Saini testified that there was nothing available in the public domain that would allow National to obtain the desired results. He referred to an article entitled: "What's the difference between stateful and stateless?" but no copy of this article was tendered as evidence. Additionally, Mr. Saini testified that he conducted research on the internet to see if there was already a solution to the problem posed by Objective 3, but he did not find one.

[39] Mr. Saini testified about the technological uncertainties in the PTS Project and to the fact that no similar program already existed. According to Mr. Saini, the technological uncertainties were as follows:

i) For Objective 1: how to achieve paging, sorting and indexing of large data sets within the MTA with a maximum response time of 5 seconds;

ii) For Objective 2: how to develop a pivot table reporting in a cross-platform and cross-browser environment; and

iii) For Objective 3: how to achieve "deterministic and stateful client-side control".

[40] The Minister made assumptions that there were no technological uncertainties in any of the Objectives and that the activities undertaken by National could have been performed by the application of existing well-known information technology techniques. The Respondent argued that the PIVOT command in SQL Server 2005 would have accomplished Objective 2, and that this was a generally accepted method used by professionals in the area at the time the activities in respect of the PTS Project were undertaken by National.

[41] For the following reasons, I find that there were technological uncertainties in achieving the Objectives of the PTS Project and that these technological uncertainties could not be resolved using routine engineering or standard procedures.

[42] Technological uncertainty may occur in either of two ways: " . . . it may be uncertain whether the goals can be achieved at all; or the taxpayer may be fairly confident that the goals can be achieved, but may be uncertain which of several alternatives (i.e., paths, routes, approaches, equipment configurations, system architectures, circuit techniques, etc.) will either work at all, or be feasible to meet the desired specifications or cost targets, or both of these" (Circular, at para. 2.10.2).

[43] I find that the Objectives are very specific and that there were technological uncertainties with regard to achieving them given the constraints National was under at the time the activities were undertaken. I find that, on a balance of probabilities, Mr. Saini has shown that he was uncertain as to which of several alternatives would work or would feasibly meet the desired specifications of the PTS Project. One has to take into account the MTA, which was the framework within which the PTS Project was being developed, as well as the fact that National had access to SQL Server 2000 and not to SQL Server 2005 during the 2011 taxation year.

[44] More specifically with respect to Objective 2, I also find that economic considerations imposed some uncertainty. This was demonstrated by Mr. Saini in his testimony and by the documents adduced in evidence at the hearing. Business

constraints and the business context of the taxpayer that is claiming the SR&ED deduction and credit are relevant factors to take into account when considering the criterion of technological uncertainty. In this appeal, while the evidence has shown that the PIVOT command existed in SQL Server 2005 in 2011 and was a generally accepted method used by professionals in the field at that time, I am not convinced that it would have achieved National's Objectives or that it would have been compatible with the MTA. I also find that the fact that SQL Server 2005 had a PIVOT command is not relevant as National was not working with that program to develop the PTS Project in 2011. As a result, I find that the resolution of the uncertainties relating to the Objectives was not reasonably predictable.

*(2) Did National formulate hypotheses specifically aimed at reducing or eliminating the technological uncertainty?*

[45] As indicated by Justice Bowman in *Northwest Hydraulic* (at para. 16), the second criterion, i.e., the formulation of hypotheses aimed at reducing the technological uncertainties, involves a five-stage process:

i) The observation of the subject matter of the problem;

ii) The formulation of a clear objective;

iii) The identification and articulation of the technological uncertainty;

iv) The formulation of a hypothesis designed to reduce or eliminate the uncertainty; and

v) The methodical and systematic testing of the hypothesis or hypotheses.

[46] Mr. Saini testified that he did formulate hypotheses aimed at reducing the technological uncertainties. Additionally, evidence adduced at the hearing, more specifically the letter dated May 12, 2012 addressed to the CRA (Exhibit A-10, the "Letter") and the Project Timeline (Exhibit A-4), indicates that hypotheses were formulated for each of the Objectives.

[47] Given the testimony of Mr. Saini and the documents referred to above and adduced in evidence at the hearing, I find, on a balance of probabilities, that National did formulate hypotheses specifically aimed at reducing or eliminating the technological uncertainties raised by the PTS Project. However, as indicated below under the analysis of the third criterion, Mr. Saini failed to convince me, on a balance of probabilities, that methodical and systematic testing of the hypotheses

was conducted by National. Accordingly, the second criterion is not met as it requires the methodical and systematic testing of the hypotheses.

> *(3) Did the procedure adopted accord with the total discipline of the scientific method, including the formulation, testing and modification of hypotheses?*

[48] For the third criterion, the adoption of the scientific method, Justice Bowman in *Northwest Hydraulic* (at para. 16) clarified that what is important is the adoption of the entire scientific method to remove a technological uncertainty through the formulation and testing of innovative and untested hypotheses.

[49] Furthermore, the Federal Court of Appeal stated in *RIS-Christie* that the taxpayer must establish that tests were performed and conducted in a systematic fashion. The Court further noted that " . . . [a]lthough both documentary and viva voce evidence are admissible, the only sure-fire way of establishing that scientific research was undertaken in a systematic fashion is to adduce documentary evidence which reveals the logical progression between each test and preceding or subsequent tests" (at para. 14). As indicated by Justice Bowman in *Northwest Hydraulic,* one must ask the following question: "Did the procedures adopted accord with established and objective principles of scientific method, characterized by trained and systematic observation, measurement and experiment, and the formulation, testing and modification of hypotheses?" ( at para. 16).

[50] Various documents were tendered in evidence by Mr. Saini, which, according to him, show that the scientific method was followed in developing the PTS Project. These documents are the Project Timeline, the Letter, a document titled "Trials to Achieve Sorting & Paging With Set Constraints" (Exhibit A-7) and various pieces of source code for portions of the PTS Project.

[51] According to Mr. Saini, the Project Timeline contains the details of the activities undertaken and the time spent on each of the activities and was completed as the work was being done. Mr. Saini also testified that it represents the hypotheses National was testing as the coding was being completed.

[52] However, upon reviewing the Project Timeline, I do not agree with Mr. Saini's position. The Project Timeline lists vague descriptions of the work being completed and some of the specific problems National was trying to overcome along with a corresponding time entry. While I have found that there was enough evidence to support a conclusion that there were, in fact, hypotheses,

this document does not show the formulation, testing and modification of these hypotheses. Further, there does not seem to be a logical progression between any of the entries in the document. The Project Timeline does not indicate how any hypotheses were tested and does not list any experimentation or the results of any experimentation. In addition, there is nothing in this document to indicate that any hypotheses were modified as a result of experimentation.

[53] The Letter is more substantial than the Project Timeline. For Objective 1, the Letter specifies that hypotheses were formulated, that over 50 experiments were conducted and that the hypotheses ultimately proved to be correct. The Letter also references the document titled "Trials to Achieve Sorting & Paging With Set Constraints" (Exhibit A-7), which is a table outlining 50 experiments and their outcomes. I do not find this table very helpful. Several of the experiments are grouped together; what is being tested is unclear; how testing is being conducted is also unclear; and the results listed are vague. Furthermore, there does not appear to be any reference to the testing or modification of the hypotheses. No similar document was adduced in evidence with respect to Objectives 2 and 3.

[54] For Objective 2, the Letter states only that several experiments were done, but does not provide much detail on the number of experiments conducted, how experiments were conducted or the results of the experiments. Moreover, the Letter does not specify how hypotheses were tested, nor does it specify if or how the hypotheses were modified as a result of the tests. All the Letter indicates is that the hypotheses were incorrect.

[55] For Objective 3, the Letter indicates that hypotheses were made and vaguely explains how the Objective was achieved. However, it does not explain what experimentation was conducted, how many experiments were conducted, or how the experimentation was conducted, nor does it set out the results in any detail. Additionally, the Letter does not specify how hypotheses were tested, or if they were modified as a result of the testing.

[56] Finally, the evidence adduced by National does include some source code. The following pieces of source code were tendered as evidence: "PTS.ASP" (Exhibit A-4, at p. 54), "GRIDTIMEENTRIES.ASP" (Exhibit A-4, at p. 69), "cursor_to_update_identity_seed.sql" (Exhibit A-4, at p. 80), "Gridtimentries.asp with ADO iteration" (Exhibit A-7, at p. 159), "RDTracker.ASP (Initial iteration)" (Exhibit A-7, at p. 169), "PTS_Report1.ASP" (Exhibit A-4, at p. 91), "PTS_Report2.ASP" (Exhibit A-4, at p. 95) and "PTS_AddTimeEntries.asp" (Exhibit A-4, at p. 98).

[57] By reviewing these pieces of source code, I am not able to determine if they are early versions of the source code, or the final product. Mr. Saini did testify that he had different versions of the source code saved on a server at home, but these versions are not in evidence. It is worth noting that "GRIDTIMEENTRIES.ASP" and "Gridtimentries.asp with ADO iteration" do at first glance appear to be related. However, no evidence was provided to show if or how these two pieces of code are related. Additionally, there is no explanation regarding if or how experimentation was conducted in order to advance from one version to the other and which is the later version, nor is there any evidence as to whether or not the experimentation proceeded in accordance with the scientific method. With respect to the other pieces of source code, I am not able to deduce a trend from a single data point and I do not see any evidence of an advancement of the source code nor is there any evidence as to whether or not it progressed in accordance with the scientific method. Since I only have one version of most of the source code, and nothing to tell me if or how the other two pieces of source code are related, there simply is not enough evidence on the record to draw a conclusion on this point.

[58] As a result, I am not convinced, on a balance of probabilities, that National followed the scientific method while carrying out the activities in respect of the PTS Project. I therefore find that this criterion is not met.

*(4) Did the process result in a technological advancement?*

[59] Regarding the fourth criterion - whether the process resulted in a technological advancement - Justice Bowman in *Northwest Hydraulic* (at para. 16) indicated that it referred to "an advancement in the general understanding ( . . .) [for] persons knowledgeable in the field." Justice Bowman further indicated that "[t]he rejection after testing of an hypothesis is nonetheless an advance in that it eliminates one hitherto untested hypothesis," adding that failure may reinforce "the measure of the technological uncertainty."

[60] According to the Circular, the activities ". . . must generate information that advances our understanding of scientific relations or technologies. In a business context, this means that when a new or improved product or process is created, it must embody a scientific or technological advancement in order to be eligible" (at para. 2.10.1). Furthermore, the activities must ". . . seek to advance the taxpayer's technological knowledge base" (Circular, at para. 2.13). Further, the technological advancement achieved only has to be slight in order to qualify as such.

[61] Additionally, it is well established that achieving a technological advancement ". . .would require removing the element of technological uncertainty through a process of systematic investigation" (Circular, at para. 2.13).

[62] Mr. Saini testified that there was technological advancement in relation to the Objectives of the PTS Project. Specifically, he testified that National invented "Dynamic SQL". Further, many steps were taken with a view to attaining each objective, even if they were not all successful.

[63] More specifically, with respect to Objective 1, Mr. Saini testified that the technological advancement had been the development of the "Stitching Mechanism" which made it possible to achieve that Objective. With respect to Objective 2, Mr. Saini testified that the experiments conducted did not bring the results anticipated, as National was unsuccessful in meeting the Objective. Finally, with respect to Objective 3, National was able to come up with a viable solution using JavaScript.

[64] I find Mr. Saini's testimony credible on this point. As a result, I find that there was some technological advancement in relation to the Objectives of the PTS Project, but not advancement within the meaning of the definition of SR&ED. As mentioned above, in order to find that a technological advancement was achieved, I would have to first find that technological uncertainties were removed through a process of systematic investigation, which I do not. Having concluded that National did not carry out systematic investigation to remove technological uncertainties, I cannot find that this criterion is met.

*(5) Was a detailed record of the hypotheses tested, and results kept as the work progressed?*

[65] The last criterion, the detailed record of the hypotheses tested and results, is not explicitly required by the Act or the regulations. However, the jurisprudence indicates that it is implicit in the notion of "scientific method" and in the fact that the expression "systematic investigation" appears in the opening words of the definition of SR&ED.

[66] In *Northwest Hydraulic* (at para. 16), Justice Bowman clarified that "a detailed record of the hypotheses, tests and results [must] be kept…as the work progresses." However, as indicated by this Court in *Formadrain Inc. v. The Queen* (2017 TCC 42 at para. 118) and in *Les Abeilles* (at para. 94) and also by the Federal Court of Appeal in *RIS-Christie* (at paras. 14 and 15), it is not mandatory

that the evidence be documentary, and testimonial evidence may be presented. Although there are risks associated with not adequately documenting a step in an SR&ED project, testimonial evidence is acceptable.

[67] Mr. Saini testified that he took contemporaneous notes while the PTS Project was being coded. In his testimony, he refers to several documents which purportedly show that a detailed contemporaneous record was kept. The documents he refers to are the Project Timeline, the pieces of source code that were produced at the hearing, a document that contains a breakdown of the time spent on each task (Exhibit A-5, at pp. 114-120), and the document titled "Trials to Achieve Sorting & Paging With Set Constraints".

[68] As I found above, the Project Timeline does not show the formulation, testing or modification of any hypothesis. Further, the Project Timeline does not indicate how testing was conducted and does not show any experimentation or the results of any experimentation. The Project Timeline is not a record of the hypotheses tested or the results of such testing. It is merely a record of the amount of time spent on different tasks.

[69] The document that contains a breakdown of time spent on each task is similar to the Project Timeline in that it tracks the amount of time different people spent on different tasks. This document does not show any testing or the results of any testing. Therefore, I do not find that it supports the assertion that contemporaneous documentation of the testing and results was kept.

[70] As mentioned above, the evidence contains some pieces of source code. If National had submitted a revision history - which it did not - or numerous versions of the same piece of code, it may have been possible to determine what tests were conducted and the results of those tests. However, such is not the case: no explanation of any advancement in respect of the code was tendered as evidence, and I am unable to conclude that what was adduced in evidence is a detailed record of the testing and results.

[71] The document entitled "Trials to Achieve Sorting & Paging With Set Constraints" is a table outlining 50 experiments that were purportedly conducted in connection with Objective 1, and their outcomes. As mentioned above, I do not find this document to be very helpful. Several experiments are grouped together, what is being tested is unclear; how testing is being conducted is also unclear; and the results shown are vague. Additionally, on cross-examination, Mr. Saini admitted that this particular document was created after the fact for the CRA but

said he had created a more basic version of the document as he went along. However, this other version was not offered as evidence. There are no similar documents for Objectives 2 and 3.

[72] As a result, I cannot conclude that any of the documents provided by National can be considered contemporaneous documentation that details any of the tests and the results of those tests.

[73] While it is not mandatory that the evidence be documentary, and testimonial evidence may be presented, I did not find that Mr. Saini's testimony made up for the inadequacy of the documentary evidence. Mr. Saini's testimony did not detail the methodology behind the testing, how many tests were conducted with respect to each objective (other than Objective 1), how tests differed from other tests conducted or what the results of all of those tests were. He testified regarding some of the problems National faced for each of the Objectives, but the explanations concerning the tests conducted were vague at best, and there was no discussion of specific measurable results. From the explanations provided by Mr. Saini, I cannot conclude that there was a "logical progression between each test and preceding or subsequent tests", and therefore I cannot conclude that National carried out a systematic investigation in respect of the PTS Project. I find that this criterion is not met.

## G. CONCLUSION

[74] National has failed to show, on a balance of probabilities, that the procedure adopted in the development of the PTS Project accorded with the total discipline of the scientific method, including the formulation, testing and modification of hypotheses, and that that process resulted in a technological advancement. Further, National was unable to show that a detailed record of the hypotheses tested and results was kept as the work progressed. Therefore, the activities undertaken by National in developing the PTS Project do not constitute SR&ED.

[75] For these reasons, the appeal is dismissed, with costs to the Respondent.

Signed at Montréal, Québec, this 7th day of July 2020.

“Dominique Lafleur”

Lafleur J.

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