

**Quarterly Mobil App/BI/Database National BILT Meeting – June 10, 2015**  
**Meeting Minutes**

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**Welcome and Introduction – Judith Morel**

Judith Morel – This morning in the Seattle Times, I read an interesting article about graduates with four year degrees from Bellevue College making more than graduates with four year degrees from the University of Washington, Washington State University, as well as, the other universities in our state. So, that was actually very exciting wage earning news for our college grads.

Matt Glover- What was the percentage difference?

Judith Morel – It didn't have percentage; it had median salaries. Starting salary was around \$48,000. That's not high in the IT world, but that was the average salary. The University of Washington, I think, was in the lower \$40's.

Matt Glover – Oh, that's great. What a testimony to the work you guys are doing.

Judith Morel – Great news for our students. I have a daughter who graduated from the University of Washington and she did not start out making anywhere near those numbers. I know that's only an example of one, but it is an example.

Meeting Link:

<https://meetings.webex.com/collabs/url/6dOZ8EQxrr2Zpunigqew-mmnro2VRvaZGDCijFID0yW00000>

**Bellevue – Programming Stackable Certificates approval**

Judith Morel – Our purpose for our presentation this morning is to present our programming stackable certificates and a new four- year degree, as we are seeking approval for those now. A couple years ago, the BILT members created a list of knowledge, skills and abilities, as our faculty team reviewed and conducted a gap analysis, comparing the KSA's that were identified with content in our curriculum. We did this for networking, cybersecurity, BI, DB and programming. In all these cases, we identified some courses that still needed enhancements. We don't have time to present each and every course. Sylvia will present the certificate and you will have this presentation to review at your leisure. Any course that was modified or updated in any way with grant funds is highlighted in a darker color. For the sake of time today, we will most likely present the curriculum and the certificate programs, ask a few questions about trends and hopefully have enough information to approve our programs.

**Stackable Certificates at Bellevue College**

Sylvia Unwin –This is our pathway into certificates in two-year and four- year programs. Students who want to do application or software development and programming, are at the top. On the far left, is an introductory to .NET Programming. This was created so that people who are skilled in other programming languages, such as C#, could do updates. It's a very useful skill needed in our area, so this introduces the fundamentals of programming. This could be done in one year, or in three quarters. We're in the quarter system at Bellevue College. This feeds into the intermediate application developer, which gives the person more of the object-oriented programming skills and a little bit of our required general education skills, i.e. communication, organizational teamwork.

Those feed into each other and also into our two year degree, called Information Systems. We have 3 tracks in that degree, so this applies only to the software development track. Continuing with our certificates, we also have programming for mobile and web development. This also is for students who already have some programming skills, but want to concentrate on the web, JavaScript, JSON, jQuery, along with mobile devices. That also feeds into our two-year degree, the Information Systems. On the far right, we have a specialized certificate for those people who want to get another language under their belt, C++, which is a shorter certificate but feeds into more of the electives and specified skills in the two year degree. This is our introduction to our two-year degree, and those who complete it are allowed to go into our Baccalaureate program, which is called (BAS) Information Systems Technology. The people who do the programming track are eligible for taking either the Application Development concentration, or the Business Intelligence concentration. We are currently in the process of creating certificates, so those people who choose to do the application development but would like to get some business intelligence courses, can apply for the certificate and take concentration courses under that certificate, and vice versa.

Matt Glover– The big thing that’s happening in the world around us is around how are we teaching our students about security at the application layer – Where is our focus on each one of these? Is the security embedded, or is it just basic concepts that we are teaching, and not necessarily anything on security?

### **Introductory .NET Programming**

Sylvia Unwin – In the Programming for Mobile and Web Development, we do have security modules embedded in a couple of the high-level classes, especially the one that is designed for Mobile Technologies. The others are mentioned. In the Baccalaureate program, the students actually take an Introduction to Security class, which includes Networks, Software Application layer, etc. It was designed for our networking students and modified to include the programming concepts and SQL, not being able to get into database or the backend area.

Sylvia Unwin – In the PowerPoint slides, there is a brief description of each of the certificates and the outcomes that we look at. You can review these at your leisure. A lot of these will include SQL programming because it is a necessary component, especially in regards to accessing data. They’re not going to be creating, modifying or changing anything, but just being able to get the data that they need. As Judith mentioned, the highlighted (darker blue), the Programming 120, is one of the courses that was enhanced with grant funds, so we did add another component to it.

Matt Glover – Is this all classroom or is there lab work?

Sylvia Unwin – They’re definitely doing hands-on application, while they are in class. They will be doing practice exercises, examples, during class time, along with a lecture, and their homework is expected to be done outside of class time.

Matt Glover – Is there a capstone course?

Sylvia Unwin – Not in the certificate. In the two-year degree, we have electives that can be an internship if the student can find one during the summer; and the four-year degree has a capstone project.

### **Intermediate Applications Developer**

Matt Glover– Where are the stackable certificates?

Sylvia Unwin – This is the stackable one [slide showing *Intermediate Applications Developer*]. They learn the fundamentals in the first one, and this one is concentrating more on the refresher on the object-oriented programming. From there, getting more into the .NET of ADO Backend and some data from SQL. So, they are writing an application.

Matt Glover – Does it stack with an industry certification, as well?

Sylvia Unwin – No. We do have students who get to this level that could take the MTA exam. They would have enough skills and knowledge to be able to pass that, but that's not part of our curriculum.

Matt Glover – Is that being encouraged?

Sylvia Unwin – Yes, we offer what we call a “Test Fest” every year where we provide free MTA exams to students and get quite a few that come in and there's no penalty. They can take it, but if they don't pass, they can try again at a later date. They get two chances to take two different MTA exams; some of them will take the Database, and some will take Software Development.

Sylvia Unwin – What certification did he ask about initially? Industry certification?

### **Programming for Mobile & Web Development**

Sylvia Unwin – This is another certificate that's kind of a stand-alone for students who have some programming; it's a little prerequisite that they have to have some programming. This is where they get some of the non-Microsoft technologies and we expose them to the JSON / jQuery, Javascript, utilizing emulators for mobile devices. Students are not required to have mobile devices with them, but if they do, it is strongly encouraged. We did have a student who had a prior four-year degree, who took the certificate. They have already been offered and accepted a position at a local company making \$85,000 a year.

### **Introductory C++ Programming**

Matt Glover – As we go to each of these certs, if you could talk about the industry certifications that compare to these and where we are in equipping the students for an industry type of certification, that would be great.

Sylvia Unwin – Can you explain to me what type of certification you're expecting? Mostly, on the software side, the industry certifications are not required as much as for the networking side of IT.

Matt Glover – Absolutely correct. I'm curious as to if there is anything you guys are leaning towards, so that when your certification comes out, it also allows the student to be equipped with an industry certification, as well. It just makes the student more marketable. Just like when we go through the networking classes, the industry certification is not the primary concern for the class. The primary concern is to get the students knowledgeable and networking. If they get the networking certification, that's fantastic. The goal is to educate students so that they can appropriately perform their job. I really like the certifications that you've laid out here. I'm curious, if there is an industry certification that stacks alongside and you encourage them grab that industry cert and leverage something that is highly recognized and can be put on their resume? It just makes the student more marketable in the industry.

Sylvia Unwin - We don't see the requirement of certification or industry certifications, as much on the software application developer side. I can't think of any for Microsoft that are displayed on job skills requirements.

Judith Morel – I don't want to turn this into a certification discussion necessarily, but I spent about seven or eight years in the certification organization at Microsoft and I introduced the MCSA (Microsoft Certified Systems Administrator). For networking folks and sys admin people, certifications have always been very prominent in the industry, obviously all the CompTIA exams, as well. But, the numbers were always extremely low for developers and the certification department really struggled with trying to appeal to that audience; they just have lower numbers. They tend to not really need it.

Matt Glover- Are you using Open Source repositories for storing the test code?

Sylvia Unwin – In the Open Source courses, especially in the mobile and the Web Development, they do use GitHub and some of those other open source repositories.

Matt Glover- That's great. A company called Gild and a couple other companies are actually ranking the code that's developed and in the open source repositories. They actually qualify whether you're a good coder or not based on the code that you put in.

Matt Glover- This is a great way to qualify people's code and to rank it against everybody else's code. They talk about how active they are on the repository and how many times their code is reused by other coders. There's a story about this guy who had been refused by Google, seven times. But after ranking as a top coder, Google quickly snapped him up and now he runs a Division over in Google. He didn't have the pedigree and wasn't a Stanford graduate, but he had the skills and capability to deliver value to the organization in a very meaningful way. That is something that students probably need to know, when they are developing their code, so that they are doing it the best way they possibly can.

Sylvia Unwin – As a faculty member, I kind of struggle with posting homework solutions on the open source repositories. We need to modify our projects within the courses because they're out there for everybody to see.

Matt Glover– I think that's great. Wait till they are a little more mature in their coding capabilities, before you start posting.

Sylvia Unwin – Luckily, it's in the second year courses that they get introduced into the open source repositories and then they start utilizing them in the upper division courses.

Matt Glover– It's also important that those students know that that stuff happens.

### **AAS-T Information Systems (Software Development track)**

Sylvia Unwin – Right. This one is for those students who are a little more serious because C++ is the more difficult language to understand and incorporate. Those who want to do embedded programming or game theory, this is a good start for them. We don't teach game theory in any of these courses, so they would have to go elsewhere to find that. AAS-T Information Systems and Software Development are our two-year degrees, under our Software Development track. The two-year degree does have three different tracks at this time. They all take core Communications,

Computation, Calculation, and general education courses. In the two year degree, we're .NET-centric, so that everything is taught in C#. C++ comes in as electives, if students want to do that. We also offer the opportunity to take Java, as electives. That would be under our Computer Science program and if they want to continue with the Web; those are also available as electives. We try to mix and match the various certificates that they may focus on, and are able to utilize under the two-year degree program.

### **Information Systems and Technology (IST)**

Sylvia Unwin – Okay, then those students that do complete the two-year degree program, can move on to our Baccalaureate program.

Matt Glover– Do you have anything on SEO (Search Engine Optimization)?

Sylvia Unwin – I know that it is discussed in a class, but as a very simple module. I don't know what course it would be in. That's a new topic, so it has been added to a course, but I'm not sure which one.

Matt Glover– If you have your foundation, a foundational understanding of what SEO is and why it is important to finding the materials that you have on your website, it makes the development of the website a lot more meaningful.

Sylvia Unwin – Right, I'll have to check into that. I know we talked about incorporating it, but where exactly, I'm not sure.

Sylvia Unwin – This is our Baccalaureate degree. As I mentioned earlier, the students that do the two-year in programming can opt to either do the Applications Development or the Business Intelligence track. They then can customize and transform data from operational data stores into a data warehouse or data storage. Extract the data, create cubes that they might need and then the application development is more again towards the web developers. We do more open source in our four-year degree than our two-year, so they've got the strong foundation in one programming language, C#. We then move them up into classes combining the two, while other classes concentrate on just the open source components.

Christina Titus – There's a question in the chat ... Are there any plans to offer electives for BI tool integration, since MSBI allows C# application interfaces connect to integrate with BIDW, at the AF level?

Sylvia Unwin - In the BI concentration, when they have to develop scripting for the ETL, it will be done in C#.

Carolyn French – I just wondered if there were any plans to move the BI track into the Associate's level, rather than, later on. I know it's nice to get a four-year degree, but a number of university programs are waiting until the Master level, just to introduce the BI pieces. I wondered if it would be a track that could be offered at the Associates in lieu of Bachelors.

Sylvia Unwin - So what we've done is a Business Analyst track that we've added to our two-year degree program that will be an introduction to Business Intelligence. We have a course that exposes what Business Intelligence is and gives everybody hands-on experience with the Tools and Analysis

Services, Integration and Reporting Services, along with giving them hands-on experience with Tableau, for data visualization purposes.

Sylvia Unwin – We do try to give them the exposure to introduce Business Intelligence and that it is a really great and exciting field. There are about as many jobs for Business Intelligence, as there are for Software Development.

Caroline French – Are there any plans to look at the big data side with something like Hadoop?

Sylvia Unwin – That would definitely be a course in our four-year degree program. We are looking at Hadoop and how to query the data. Looking at integrating Pig into it somehow; it definitely is in the works.

Matt Glover – There's a large data explosion happening, especially with the internet of things occurring all around us. When you turn data into intelligent information or actionable information, it becomes meaningful for someone to make a decision with. Having those people in place that can transition the data into actual information is definitely a new trend that is pressing really hard on our education system.

Sylvia Unwin – Right, we even have recruiters who are waiting for graduates to come out.

Judith Morel – Just a reminder, it's been a couple years since we presented this. We have stackable certificates in Business Intelligence for Database Analyst, but since we already put that to the committee, we did not want to repeat ourselves. But if you do want those tracks, we can send that to you. As a reminder, the BAS degree that Sylvia just reviewed is new for us and some of the content for the tracks is still in development. We want to present this because we actually have seven completers, but we just launched the degree, so it's very new for us. Your input is timely, and extremely valuable.

Sylvia Unwin – I agree.

Matt Glover – Are you looking for input in this meeting or are you going to give us time to review the material? What's the outcome you're actually looking for today?

Judith Morel – I wanted to get approval for stackable certificates and the degree that Sylvia has reviewed, but I also understand you need some time to look at the individual courses that support each of the certificate and degree programs. Christina, should we provide a date to get BILT approval? It's a little unfair to seek approval if they don't really understand all the individual components.

Christina Titus – We can give a week time frame if that seems reasonable for the businesses, a response by the end of next week.

Christina Titus – Matt, what we're looking for is your recognition of all these programs that were presented, but we want to give you time to review what's in the courses and how the courses are laid out.

Matt Glover – I think the challenge is that they really need an industry team to take a look at this and give them candid feedback on what might be gaps, what’s missing, or where they might be spending time in courses that are not as valuable to us in the industry. They might be taking up a portion of the credit hours that they’re trying to push forward. That’s essentially what you’re looking for, right?

Judith Morel – We exist because of our local employers, and their needs are heavily weighted in .NET Programming and C++. C# skills probably more so than other regions of the country. One of the courses that we developed uses an example from Tableau software. An example is one reviewer, who is faculty from one of the other parts of the US (this was a BI course, by the way). First of all, they were saying we should have used Excel, but that’s not a Business Intelligence application, so I was surprised by that comment. Secondly, they criticized using Tableau. Sylvia mentioned that anyone that has used our certificate program and received a certification in Business Intelligence is snapped up immediately, so we must provide students with experience for our employers. I really want your feedback and I also need to consider who’s in our backyard.

Matt Glover– Absolutely, that’s the whole focus of not only the National BILT, but each of the regional BILTs--- to go through and provide very specific feedback for the betterment of all the students in the local area. It’s the local area that’s going to be providing those positions. .NET is not just something that happens in Seattle. I have an entire team of .NET developers; that is very strong and vibrant in Dallas.

Sylvia Unwin – Great, I’m glad to hear that.

Matt Glover- That’s great. It actually looks really well put together. I like the way you mapped everything, so I’d like to look more at each of the coursework elements. I’d also like to get your phone numbers to call you directly with questions. Then I can provide some candid feedback. (Contact info available on the slide deck. Judith to send out phone numbers).

Carolyn French – I wanted to address a comment about Excel, having worked in the Business Intelligence environment, where users tend to operate heavily in Excel before they ever see Tableau or a product like that. I think that whoever is making a suggestion to use Excel as a foundation, was thinking in the same terms as most courses that start teaching some kind of database program; they start with Access. Excel has a built-in component that’s a plug-in called PowerPivot tables, which take on the same functionality as Tableau, in respect to creating dashboards. It would be an excellent way to begin a student with the learning concepts around building dashboards because you can do it in Excel, if you install the plug-in for Pivot Tables.

Sylvia Unwin – I believe in our Excel class, they do connect to a SQL database and provide something similar. It’s not as complex as an entire dashboard, but you do access a multi-dimensional database. In our introduction, we have one module using Excel. We do use PowerPivot tables in our Introduction to Business Intelligence course. It is used, but we do more of the data visualization charts and graphs because of the multi-dimensional databases that we’re connecting to in SQL. Students are really having a lot of fun with it.

Sylvia Unwin – Excel is still in there.

Carolyn French –My experience has been limited due to my working in the oil and gas industry and we have other products with the same features and functions as the Pivot tables.

Sylvia Unwin – That’s a great skill to have. I wish I knew that.

Matt Glover – I think both comments are very wise. The difference is that Excel is like having a two-dimensional drawing, and when you get into the greater elements of Business Intelligence, you’re talking about 3-D Modeling. Those are the two different kinds of conceptual breakdowns. When you talk about big data and Business Intelligence; in general, you’re going to be using a BI tool. When you talk about small data, it’s what runs companies and small companies use Excel, at the moment. We need to be very clear about understanding the importance of Excel; I don’t think anybody takes that for granted. Actually, once you get the 3-dimensional data out of a Business Intelligence tool, then you can start manipulating that data in a meaningful way with Excel for a very specific focus to a question.

Matt Glover– I’m perfectly comfortable with recognizing this as it is, but I would prefer to have a week to review. I’m hoping the other BILT team members on the phone would like to review it as well, and provide any feedback.

Matt Glover - The National BILT level is so focused on getting our students equipped with soft skills. We talk about stackable certificates, but it’s also stackable skills that we’re really talking about. They develop something and make them into a really complex integrated system. So, you can see the mastery of each of the basic knowledge skills that they develop, as well as, getting to see them all work together in the class. How does each of these basic skill courses build themselves, so that the student can experience more of an integrated skill set? How does that then build itself to a mastery of basic skills?

Sylvia Unwin – Ok, I can see clearly that we do increase the amount of work and incorporating different concepts or areas into the programming. They start with the basics / fundamentals and expose them to the ASP. NET and ADO link database access. They continue on with identifying patterns and how they work together, as they progress through the two-year degree program. We do use some team integration in one course that I’m aware of, but not all courses do that, especially at the introductory level when they are learning fundamental skills on their own. In the classroom, they work in groups or they work in teams, but I can’t validate that.

Matt Glover–How does a student build a portfolio? After they go through the first year of basics, are they now able to create something tangible with the knowledge from the first year, while continuing through with the second year? The stackable nature of educating our students would be using an application development “capstone”.

Sylvia Unwin – Definitely. I know one where they have created in ASP.NET. An application that goes to a database on SQL server was populating pages, keeping track of CD’s and images. Of course, it ends up on GitHub; it’s out there for everybody to see.

Sylvia Unwin - Yes, they do create a portfolio. We do strongly encourage them to store their portfolio, whether it’s the Cloud, or we have the new Amazon web services that allow for storage of things that they develop. They do get exposed to all of these different types of places to keep their applications. Also, in my classes, I strongly encourage students to modify them. Don’t just do what I’ve asked you to do for the class, but take it home and make it yours. Add your twist to it and that way they will have something to show potential employers. So, they do come out with completed projects from the various classes in the 200 level courses.



Matt Glover–That was a great presentation. Justin Ranton sent out a list of links for portfolios. If we can get the Bellevue students to start early and keep up to date every quarter (or semester) when they finish their work, it makes it so much more powerful for them to recall in their school setting, as well as, relate to the real work experiences that they go into.

Sylvia Unwin – I would definitely be interested in reviewing the links and seeing what was out there. If it impressed you that much, I'm sure it would impress others, and would be something we would like to take a look at.

Matt Glover– There might be a great opportunity. You guys are doing such great work on the social media elements of what we're capturing within the BILT. Maybe that's something that we could capture and put into a social media blog, so that everybody can tap into it.

Any other questions for Bellevue?

Carolyn French –Does your course that is teaching Tableau as a tool talk about any of the GIS integrated functionality?

Sylvia Unwin –At this time, no we don't focus on GIS at all.

Carolyn French –I'm also on the GIS BILT team. There's an overlap of skills from a developer's standpoint that gets introduced when dealing with the Business Intelligence track. That may be an area to take a look at strongly because of what I've seen in the industry. They tend to not want a full GIS person, but somebody who knows how to integrate the technology, map servers. Tableau does have its built-in GEO web Prop Component, but it also integrates ESRI. Those skill sets are kind of ordered down in terms of the need, but it's great to have because I've seen a lot of postings that are requiring some kind of skill set in that GIS integration.

Sylvia Unwin- I'll look into that. If you can send me any further information, I'd appreciate it.

## **Trends**

Matt Glover –When it comes to development, there is a massive trend that's hitting us really hard in late 2014, early 2015 and it's called DevOps. Have you guys heard of this?

Matt Glover – DevOps stands for Developer Operations, and it is a new trend on being able to rapidly respond to the needs of development. Instead of having many months go by, as developers work on something to get that delivered, it's microsurgery on a macro level. Think of it that way; when was the last time you guys saw a maintenance notification from Amazon that they were going down for maintenance?

Matt Glover- How about Google? When is the last time you saw that? How about Bing? No?

Matt Glover– The reason is because they never go down. The reason they never go down is because they use a concept that is foreign to many companies called DevOps. Normally a company, like an online shopping organization, would go through a freeze period of making any changes at all while they hit their Black Friday/ Cyber Monday. The DevOps model says they are actually making more changes during their rush time, than less. I find it very fascinating, and it's a wildly different way of

thinking about how to deal with IT. What's amazing about it is that it may be a foreign concept, but it works.

Matt Glover –What else do we have for an application developer-type trend? Okay, one more. We have lots of data points that are happening, and to the point that was made earlier regarding Geospatial Technologies. All of that culminating into a point where we need Data Scientists to go through all the data. If you need a Data Scientist, you're going to need a whole bunch of Data Analysts, and below them, entry level Analysts. This is right to the point of what Bellevue College delivers: a Business Intelligence style degree, in certifications. That progression is going to continue to move forward in a way over the course of the next ten years.

Carolyn French –If you're going to have Data Science and you have the Data Analyst, the Analysts use R, like the Data Scientist. It takes us back to the big data platform to a certain degree, when analyzing the data; is there a certificate that is focused on the Data Science side in one of the programs?

Sylvia Unwin – We have just launched a new four-year degree called Data Analytics, which we have looked at calling Data Science. We thought a lot of people might not understand what that term was, when we were working on it a couple of years ago. This is more of the technology mixed with statistical analysis of the data. They are planning on using R because it's free and easily accessible. Hopefully we're looking into also utilizing SAS in some of the classes. We have the high end, and our 2 year degree program is the low end with some of the Business Analyst. Then some certificates in the Business Intelligence area for the Data Analyst, and those students will then progress, if interested, towards the four-year degree, in Data Analytics, which is our Data Scientist program.

Carolyn French –In your two-year program, what tool are you using? StatTools, or something like that?

Sylvia Unwin – Right now were going to be looking at just introducing students to R; it's the Associate's level.

Carolyn French – Great. I'm trying to learn that now and I already have a map of business intelligence, so it did not get introduced. I'm in Texas and what I've seen in the last seven months has been five university programs that started Master level programs for what is considered Business Analyst, Data Analytics or Business Intelligence; there is only one that actually had a full program before that.

Sylvia Unwin – We're now having students that can't decide whether they want to do the Business Intelligence or the Data Analytics; the Business Intelligence program is very technical. We just recently launched it in fall quarter, and so we'll look and see how the students are doing. It's very heavily statistics- oriented and they are now being exposed to more of the statistical software than at the two-year level.

Carolyn French –I had to take a Data Science course, big data with Hadoop course, just to get the tools. It was not introduced at any other level, and I have a Bachelor's degree in GIS. It's nice to hear that university programs are actually looking at how they are using guidelines and the curriculum versus what's happening in the industry, because I'm backtracking on it.

Sylvia Unwin – I'm glad we're looking into it and starting our program, hopefully we'll evolve as it continues to move forward.

Matt Glover– Judith and Sylvia thank you so much for walking us through your degree program; it's very exciting times for you guys. I really appreciate all your time.

*Adjournment at 11:06am*